80-U.S.

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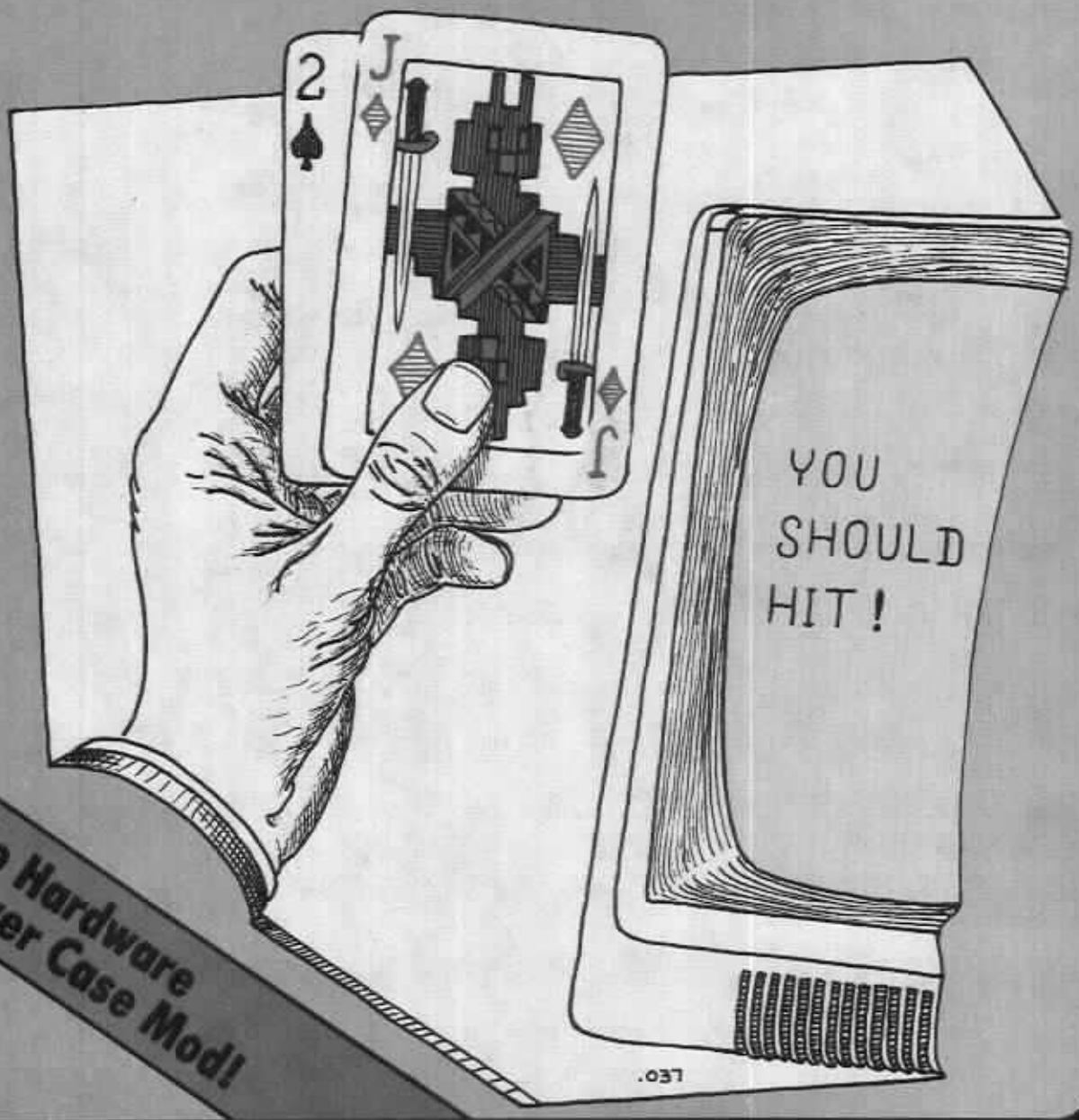
The TRS-80 Users Journal

Volume II, Number 4

July/Aug 1979



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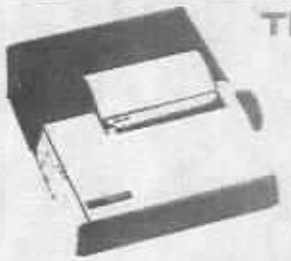

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THE JOURNAL FOR TRS80 Users

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LVIDSKSL Stores, retrieves Lev I programs to disk
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THE LIBRARY 100 by Bottom Shelf: a 5-cassette album with 100 business/finanacial, educational, home, graphics, and games programs: 16K Lev II:
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RANDOM ACCESS

NEW SUBSCRIPTION RATES

Effective with our next issue (Sep-Oct 79), new rates will be in effect for Canadian and foreign subscribers. We have been "nice guys" for the past year, but the post office isn't having any of it, so we simply have to pass the cost along - sorry. US RATES WILL REMAIN UNCHANGED. But, you now have the option of a 2 or 3 year hitch with **80-U.S.** We didn't offer them before, but since it looks like we are here to stay, - why not? Here are the new rates: US $16, $31,$45 for one, two and three years½ Canadian $20, $39, $55 for one, two and three years½ all other $24, $47, $68 for one, two and three years. The "all other" are all sent airmail. Canadian are sent first class. Alaska, Hawaii and US possessions with zip codes may request first class mail and remit payment at the Canadian rate.

RENEWAL TIME ALREADY!

If the three letter code at the upper right of your mailing label says "PB9" it means that the Sep-Oct 79 issue will be the last of your subscription. We will be sending one renewal notice (we can't afford to keep bugging you about it like the biggies do). Why not take care of it now, while you're thinking about it, we have some very exciting material planned which you won't want to miss!

BACKSPACE

A very large number of our May-Jun 79 issue got out with two pages switched, and on the lead article, no less! Although we caught it before the run was complete, the shortage of paper forced us to send them anyway. Our most sincere apology, and a promise for better quality control by our printer, are extended.

FUNNY LISTINGS

If you haven't read the Mar-Apr issue, and have some of the new animated/sound programs by Leo Christopherson, you may be in for a surprise when you list them. In short, they don't list like normal programs. Leo uses "String packing", which causes basic control words to appear in the listing. This makes it look exactly like a bad load. The final test, of course, is to RUN them.

BACKSPACE

It was called to our attention, shortly after the May-Jun 79 issue was out, that there was a funny looking semicolon in line 400 (page 17). Also that the line didn't seem to make much sense. We checked several copies from early in the run and later, an found an extra speck of something on the early ones, making a comma look like a semicolon. The line should read: 400 IFMN<=TV(I), ONIGOTO etc, etc. The funny semicolon was after the TV(I) and should be a comma, not a semicolon.

NEW STAFF MEMBER

If you should call 80-U.S. and hear something other than the editor's usual gruff harumhing, it will undoubtedly be the voice of Cathy Shappae, our newest addition to the staff. Please treat her kindly, while she picks up the wierd terminology we are all accustomed to using.

80-U.S. IN EUROPE!

80-U.S. now has a distributor for central Europe. The Journal is being distributed through the Hofacker-Verlag, in Munich, West Germany. Winfried Hofacker, President of Hofacker GmbH, anticipates translating and reprinting several of our previous articles in book form. We are gratified with the reception we are receiving from Europe.

BACK ISSUES

As of this writing, (May 79), our supply of back issues is down to a few file copies with the exception of the May-Jun 79 issue (Vol. II, No. 3), which is still in good supply. With any luck, our very first issue of Sep-Oct. 78, will be reprinted in our first anniversary issue as a bonus section.

NEW PRODUCTS

HOUSTON MICRO-COMPUTER TECHNOLOGIES, INC. has recently become a distributor for Centronics Computer Corp., Houston Micro-Computer, located at 5313 Bissonnet in Bellaire, Tx., sells, services and trains users in operations of Micro-Computers. They feature the entire Centronics Line, including the 700 series, popular with the TRS-80, the P-1 Microprinter, and the 6000 line of band printers.

702'S

SOUTHWEST MODULARS DEVELOPMENT CORP., P.O. Box 85, Alva, Ok. 73717 offer "LPRINTING" service. They offer Centronic 702's for those needing L2 or Disk Basic programs printed in quick fashion. One copy of maximum 500 lines for a nominal charge of $6.00, additional copies at $3.00 each.

DATA MANAGER

MICRO ARCHITECT, 96 Dothan St., Arlington, Ma. 02174, has announced the new IDM-III, an INTERACTIVE DATA MANAGER for TRS-80 DOS systems of 32K and up. Priced at $49.00, the IDM-III provides a general purpose, interactive, simple but yet powerful solution to database management. It contains a data initialization sub-system, a data manipulation sub-system, a report writer sub-system, report generator and supports both sequential and random access. Write for further information.

IT SORTS!

Tired of waiting for a sort to finish? RACET COMPUTES, 702 Palmdale, Orange, Ca. 92665 has one which will sort 1000 element arrays in 9 seconds!! This is part of their GENERALIZED SUBROUTINE FACILITY "GSF", which also has routines to read and write arrays to tape, compress and uncompress data and much more (see ad elsewhere this issue.)

PRINTERS AVAILABLE

COMPUTER TEXTILE, 10960 Wilshire Blvd., Suite 1504, Los Angeles, Ca. 90024 have a line of NEW and RECONDITIONED PRINTERS for use with the TRS-80, including the Diablo Daisywheel for use with the TRS-80, including the Diablo Daisywheel and the Qume Sprint 5. The reconditioned Diablo runs at 30 cps and has full graphics capability, in

addition to being a complete I/O device. It sells for $1995.

LOW COST IDEA

NESTAR SYSTEMS has introduced CLUSTER/ONE (TM), a low cost distributed processing alternative to Basic timesharing. The central cluster/one unit (the Queen) connects up to 15 personal microcomputers (the Drones), via a high speed parallel data bus (the ClusterBus). Programs and data files can be shared among the users of CLUSTER/ONE, and permit each basic user to have his own computer, rather than a small share of one central processor. For further technical information contact Nestar Systems, Inc., 430 Sherman Ave., Palo Alto, Ca. 94306 (415)327-0125.

PROGRAMS AVAILABLE

SERVICE ENTERPRISES, 2855 Mitchell Dr., Suite 235, Walnut Creek, Ca. 94598 (415)935-2500 have released a sample of available PROGRAMS FOR TRS-80, both tape and disk programs. Included are general ledger, construction job status, pool building company job tracking, job shop labor/batch distribution and telephone bill accounting and audit.

DISK MAILER

We are back to square 1 again (SQUARE 1, 614 eighteenth Ave., Menlo Park, Ca. 94025),this time to look at what they call "floppy-ARMOUR*(TM)*". It is a tough, light disk mailer, for 5 inch diskettes. Mails first class for just 41 cents postage and protects your diskettes. Cost per thousand is 47 cents each, under 1000, 60 cents each. Looks like you have the envelope and protection, all in one.

UTILITY PROGRAM

THE CPT SHOP, 39 Pleasant St., Charlestown, Ma. 02129, has a utility program called "KVP" written by Lance Micklus which runs under DOS or L2 Basic. Among other things, it allows you to use an external keyboard, eliminate upper and lower case on your screen, and exchange programs written in Basic with other computers. Write (or call 617 242-3350) for more information on this.

MONITOR AVAILABLE

If, in the process of programing in machine language for L1, you have been having difficulty due to the fact that T-Bug is coresident with L1 Basic's stack, an inexpensive solution is at hand. It is a monitor called "HI-'mon", and resides at the top of memory in L1. Hi-Mon has 5 functions: memory (MODIFY/EXAMINE), JUMP, READ TAPE, WRITE TAPE, and HEX dump. Available only from CONTRACT SERVICES ASSOCIATES, 1846 W. Broadway, Anaheim, Ca. 92804 for $4.95 postpaid (specify 4K or 16K version).

DISKETTE SIZE DOUBLED

SQUARE 1, 614 Eighteenth Ave., Menlo Park, Ca. 94025, has what they call a "FLIPPY DISK KIT". With it, you can double the size of your available diskette space. The kit comes with complete instructions, and lets you punch the proper holes (without harming the diskette), so you can use both sides. It is priced at $9.95 plus $1.00 shipping.

(Continued on page 35)

80-U.S.

JOURNAL

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Editorial Remarks * *

How about that? With this issue we come to the end of our first year. It has been an interesting and exciting year, starting with a 16 page journal (called 80-NW). The first issue (Sep-Oct 78) was printed on the Radio Shack line printer. Those few ads we carried in the first issue were for the most part, hand drawn. It was, as all issues since have been, like a new baby being born. You wonder each time, if it will have three left feet. (some almost did!).

At first we thought we would be regional, but then orders came in from Florida, New York and Maine. So, we soon changed the name to 80-US. Yes, we were a "garage" operation, but only for four months. Long about the first of December it became apparent that it had to be full time or forget it. So, it became full time starting the first day of 1979. Now, we have been half way around the world, and to the west coast computer faire, so we must be committed to what we are doing.

Our thanks to all who support us, especially our advertisers; you made it possible. And our special thanks to Cal, of the International Ribbon House (who has been on the back cover since Issue No. 1). Cal was our first advertiser. One day we asked him to advertise and when he asked how many subscribers we had, we said there were none, yet. He said, "You gotta start someplace", and joined up.

It has sort of been that way ever since. We seem to be too naive to know it can't be done, so we go ahead and do it! We have had a lot of help, from many people, the regular crew: Tom Rosenbaum and his technical expertise, Leo Christopherson and his unique form of magic, Terry Dettmann and his unbounded energy and output, George Blank, Roy Groth, Kristi Schmidt, Dr. Livingston, Bob Platt, Cathy Shappae, Phil Pilgrim, John Strader, Kathy Huston, Rich Mulkey; and all the others, who help but are not regulars, like Mike Freeman, Tony Pepin and more.

Thanks also to our fine contributors, and a word for them: If you haven't seen your article in print yet, hang on, we are getting bigger and will need all we can get!

The coming year should see us move into larger quarters, perhaps even put some color in the ol' mag and maybe even a hard cover? It has been fun, just like it should be, and we are looking forward to even more next year! - Mike

LETTERS

Editor,

I was quite surprised and pleased, when my first copy of the JOURNAL arrived in only ten days. I have build the BETTER BYTE BOX (80—US Issue 4) by Ray Thompson. It works great, and wouldn't be without it now. I bought all the parts from Radio Shack, it makes a neat package. I did put the two miniature plugs in side by side, and bought a shielded cable (3 feet long) and went in one plug with the TRS-80 and plugged the other cable into the earphone of the cassette. It works fine, many thanks to Ray.

Charles E. Harper
Pittsfield, Ma.

Dear Sir,

Thanks for the copy of 80-US. To a "from scracth" beginner like myself it makes more sense than any I have seen. Please keep a section at least, for the beginner. I don't understand a lot of this new world of language, like double density (could you mean double precision? Ed). I got more from your one copy than from several different "biggies", and don't want to miss a single copy.

Don H. Smith
Rockingham, NC

Dear Sirs,

First I want to thank you for the copy of 80-US. It is much better than a glowing description or a promise of an extra issue "if"I subscribe. I have a Level II 48K unit and am enjoying it immensely. I have a great deal to learn and think your JOURNAL will help very much.

R. Cook, Jr.
Perrysburg, Oh.

(We sent out several hundred back issues to those who requested more information via the Reader Service Cards in Kilobaud and Creative Computing, where we had advertised earlier this year. Needless to say, we are as happy with the results as you are. Ed)

Gentlemen,

Thanks for the complimentary copy. It sold me half way thru and I ran the Bowling Program and it was great. Hope to see more in the future. Keep up the good work!

Bob Scaffidi
Doylestown, OH.

(Thanks Bob! We were beginning to wonder if anyone could get bowling to run properly. Bowling probably generated more mail than any other single article we have done, it's nice to hear it worked for you. Ed)

Dear 80-US,

I found your Jan-Feb 79 issue very informative and outstanding. The View from the Top of the Stack about machine language is very helpful. Also, is it possible to get a listing of ANDROID NIM? After seeing several references to it I would like to see the program to learn more about programing.

Douglas T. Cox
Ann Arbor, MI.

(Android Nim is available from 80-US for $8.00, see ad elsewhere this issue. When you have taken that apart, you will indeed know something about programing, since it is quite complex, but not impossible. The new version of NIM with sound is even more complex, and because of a new string packing technique, is extremely difficult to decipher. Don't let this stop you though, dig in! Ed.)

Friends,

My friends and I have had so much enjoyment with ANDROID NIM I just have to see what Leo C has come up with in his new programs (Android, Snake Eggs, Lifetwo all with sound). I noticed elsewhere in the Mar-Apr issue an ad for a MEMORY TEST program by Software 80. is this from your shop? Thanks for the past good service and for a great publication?

G.T. Cross
Solana Beach, Ca.

(We certainly don't want to take anything away from ANDY, but think that SNAKE EGGS and LIFETWO will eventually top the popularity of ANDY. SNAKE EGGS is running a very close second now, and gaining. This all makes Leo very proud, and keeps us all busy keeping up with the demand.

About Software 80 - they are not us. I also hear thru the grapevine they are no longer in business. Ed.)

Editor,

I am pleased with your publication and look forward to its continued regular arrival. Keep up the good work.

Here is a little programing trick you may wish to pass along. The Nov 78

Newsletter from Radio Shack contained a short program to turn the tape recorder on and off from the keyboard without pulling the plug. Line 110 INPUT" REPOSITION TAPE, PRESS (ENTER) WHEN READY";A$ - does not work for me. Adding :OUT 255,0 to line 110 does turn off the tape deck very nicely. however, I used the following: 100 INPUT "PRESS (ENTER) TO TURN RECORDER ON"A$:OUT255,4
110 INPUT"REPOSITION TAPE, PRESS (ENTER) WHEN READY";A$:OUT 255, 0
120 GOTO 100

I also use the following to put a short additional blank space on certain data recording tapes between recorded data records: 100 OUT 255,4:FOR L = 0to125: NEXTL:OUT255,0

Thanks for a good, regular publication

Tom Swalenberg
Columbus, OH.

Dear Sir,

I think you should change the name of your fine magazine to: 80-US JJOURNAL

R.O. Thornburg
Pomona, Ca.

(Or maybe we should have called it KKKey BBounce! ed.)

80-US,

I just received my issues of 80-US and the one word which describes it is *fantastic!*

Also I want to pass along a few tidbits I have come across with my TRS-80. First off, MICROCHESS 1.5 by Peter Jennings can be beat in five moves E2-E4, D1-F3, F1-C4, C4-D5 and F3-F7. Although these moves are simple the program deserves a round of applause.

Second, if you want to disguise a password in a Basic listing use SHIFT and the letter, the letter will print the same, but hold a different value e.g.
10 INPUT"ENTER PASS COSE";P$
20 IF P$ = "80-US" (see note) THEN 30 ELSE 10
30 REM Continue to program

NOTE: The "US in line 10 and 20 both have to be entered with the shift key depressed.

Ted Fisher
Danville, Il.

(Thanks Ted, neat idea that will probably drive someone who doesn't know about it crazy, even after you tell them what the password is. Speaking of Chess- there is an old saw about the guy who says he can play the two best chess players in the world at the same time. If one of them will play black and the other white, he says he can guarantee he will beat at least one or stalemate both. He then simply duplicates their moves, and in effect they are playing each other. He can't lose. We have SARGON and have played it on two TRS80's that way. It seems that white always wins on the 30th move, but there are some interesting situations which develop along the way. I am a less than fair chess player and have only managed to beat SARGON once in about a dozen games. It was looking ahead 2 moves and I trapped its king on the 19th move. The king fell over! Ed.)

Mike,

Just want to say thanks for another great issue. Are you sure we can't talk you into going monthly in the near future?

I enjoyed your article on page 31 of Mar-Apr 79 entitled "The Magic of Leo C". Do you suppose that 80-US could persuade Leo into sharing some of his techniques. Let's further the art of good programing, like those produced by the Magic of Mr. C.

I also wish to let you know that I have purchased a Heathkit H14 printer (kit) and plan to interface it to my TRS80 and would you be interested in hearing of my endeavor and how it all turns out?

Dennis L. Guerin
Bloomington, MN

(By all means, Dennis! That is what we thrive on, reader input, and since we are still trying to be a profit making organization, we pay for that type of article- and you profit too!

By now you have undoubtedly received your May-June 80-US, and as you can see, we did persuade Leo to tell us about his string packing technique. And-in this very issue he details the evolution of fast graphics, from SET with a FOR NEXT loop to his "quick turn on" graphics. As a bonus, he tells all about using LPRINT or NAME as a vector to machine language routines.

About going monthly-we hope to do that someday. It just isn't possible yet. The reasons are simple: Twice the cost (and quantity) of articles, twice the cost of printing and mailing, twice the cost for people to do it- and only one half the time to do it in. All this at the same price per subscription, too (which is already considered rather high by some). What we are doing is to get larger issues; note most of the May-Jun issue was in 8 point type instead of 10 point. After some time we may go to 10 issues per year, leaving out July and August. At the rate we are growing, it may be sooner than we think, bear with us awhile and see. Ed.)

Dear Sir,

The thought has been on my mind lately to build an interface which would allow the TRS80 to read Bar Code of the "Paperbyte" (TM) type through its cassette input port. Of course this wouldn't be of much use unless someone was publishing bar code listings of their programs. The next thought was to develop a system using one of the new printers which has the ability to print with high resolution by using a multiple pass 7 dot print head. This system would take a basic or machine language program listing and produce camera ready machine readable bar code. It might be best to produce the original at 2X to insure high resolution and then reduce it for final copy. I feel this system could be based on any micro so why not the '80? It would probably need the storage of a disk or two. Then all the fine publications could arrive at a standard, or better yet have those who produce the system, establish a standard bar code language. Each systems bar code reader software could interpret the common code into the language the particular machine understands. There will have to be a general system configuration for different types of programs, but that shouldn't be too difficult to work out.

But to start Basic, let's get this idea up and running on the TRS80. After all, computers are supposed to remove the mundane from our lives. Sitting at a keyboard for hours on end entering and debugging programs that have already been entered and debugged is a waste of human creative intelligence. Having to buy a cassette of each program is a waste of cassettes and why shouldn't the next generation of micros have this capability in the same way most now have the ability to deal with cassettes? Seems right to me, what is your opinion? If anyone wants to invest in this idea, please let me know-it shouldn't be hard to make this idea fly.

M. Foster III
388 Spring ST.
Newport, RI 0 2840

(Sounds good, Murray, but first let's find out why Byte Magazine was so hot for it a couple of years back and has since apparently dropped it. At the risk of sounding trite, there is no use "Re-inventing the same Wheel", especially when we can find out beforehand that the wheel is prone to having flat tires. On the other hand, maybe when Byte did their "Paperbyte" its time had just not come. Let's hear from anyone with ideas on this subject. Even if it were only compatible with the '80, it would still represent one huge chunk of the computer population. If it is true that those who wield the biggest club, call the shots, we should be in a good position. But, let's call those shots with care and as much visibility as we can get. Ed.)

REVIEW:

NEWDOS +

T. Dettman
Associated Editor

Radio Shack's DOS 2.1 has been full of minor errors for which correction is promised. Now, APPARAT, Inc. of Denver, Colorado, has come out with NEWDOS +, not just a new DOS, but a whole system of utilities for the Disk System user.

NEWDOS itself includes a large number of improvements over DOS 2.1. Despite this, it is essentially the same as DOS 2.1. However, some of the changes make it incompatible with DOS 2.1 modules. To load the system, you must boot the system with the NEWDOS disk, not simply change disks.

The major changes included in NEWDOS are:

Add command DIRCHECK to test and list a disk directory
Expands validity checks to most disk write operations automatically
Disables all passwords checks
Adds a 50ms key debounce routine
Adds screen display printout when the 'JKL' keys are pressed simultaneously
Adds on 'OPEN "E" ' function to BASIC which lets you write to a file starting at the end of the file
Fix the APPEND command in DOS
Add the capability to turn off the 'invisible' attribute with the ATTRIB command
Adds to BASIC the capability in LISTing to use period (.) to list the current line,down arrow to list the next line,up arrow to list the last line,shift up arrow to list the first line,shift down arrow to list the last line,comma (,) to edit the current line
Adds the capability to FORMAT a disk that has data already on it
Adds the capability to execute DOS commands using the CMD function from BASIC
Changes I/O to sector type to speed up BASIC LOAD and SAVE operations.
FORMAT and BASIC may be executed from DOS READY with a single line containing all parameters.
COPY is expanded to handle all disk copying requirements including BACKUP
A REF command has been added to BASIC to list a reference list of all variables used in a program.
A RENUM command has been added to BASIC to allow program renumbering conveniently from BASIC
L, E, or D may be used in place of LIST, EDIT, or DELETE

In addition to the added capabilities above, NEWDOS also makes many minor changes of interest primarily to systems programers, but all of them correct minor errors from DOS 2.1

If you buy NEWDOS with the PLUS (+) you also get the best TRS80 utilities available. These include:

An improved DISKDUMP program
The Radio Shack Editor-Assembler modified for Disk I/O
A Level I BASIC that will execute in the DOS enviornment with a program to store Level I Basic programs on disk!
A Disassembler that will work on either disk modules or programs in memory
A program to offset load modules so they can execute from disk
Apparat's SUPERZAP, a program that allows you to look at and modify disks or memory directly!

The figures included with this text show some of the capabilities of the system.

AN EVALUATION

NEWDOS had only recently been released.

(Continued on page 12)

```
FILE DIRECTORY --- DRIVE 0      NEWDOS+   -- 03/15/79

DISKDUMP/BAS          BASIC1/CMD            DIRCHECK/CMD
DISASSEM/CMD          LMOFFSET/CMD          EDTASM/CMD
LV1DSKSL/CMD          BASCON/BAS            AUTOEDIT/CMD
SUPERZAP/BAS

DOS READY
DIRCHECK
OUTPUT TO PRINTER? Y
WHICH DRIVE CONTAINS TARGET DISKETTE? 0_

NEWDOS+      03/15/79

AUTOEDIT/CMD          EOF = 1/193       1 EXTS    5 SECTORS
BASCON/BAS            EOF = 6/231       2 EXTS    10 SECTORS
BASIC/CMD      I      EOF = 19/119      2 EXTS    20 SECTORS
BASIC1/CMD            EOF = 19/0        3 EXTS    20 SECTORS
BOOT/SYS       SIP=6  EOF = 5/0         1 EXTS    5 SECTORS
COPY/CMD       IP=6   EOF = 4/253       1 EXTS    5 SECTORS
DIR/SYS        SIP=5  EOF = 10/0        1 EXTS    10 SECTORS
DIRCHECK/CMD          EOF = 12/236      3 EXTS    15 SECTORS
DISASSEM/CMD          EOF = 19/134      1 EXTS    20 SECTORS
DISKDUMP/BAS          EOF = 9/242       1 EXTS    10 SECTORS
EDTASM/CMD            EOF = 31/154      1 EXTS    35 SECTORS
FORMAT/CMD     IP=6   EOF = 14/8        1 EXTS    15 SECTORS
LMOFFSET/CMD          EOF = 6/224       1 EXTS    10 SECTORS
LV1DSKSL/CMD          EOF = 2/141       1 EXTS    5 SECTORS
SUPERZAP/BAS          EOF = 53/170      3 EXTS    55 SECTORS
SYS0/SYS       SIP=7  EOF = 12/93       1 EXTS    15 SECTORS
SYS1/SYS       SIP=7  EOF = 4/142       1 EXTS    5 SECTORS
SYS11/SYS      SIP=7  EOF = 4/236       1 EXTS    5 SECTORS
SYS12/SYS      SIP=7  EOF = 4/164       1 EXTS    5 SECTORS
SYS13/SYS      SIP=7  EOF = 3/9         1 EXTS    5 SECTORS
SYS2/SYS       SIP=7  EOF = 4/52        1 EXTS    5 SECTORS
SYS3/SYS       SIP=7  EOF = 4/76        1 EXTS    5 SECTORS
SYS4/SYS       SIP=7  EOF = 4/186       1 EXTS    5 SECTORS
SYS5/SYS       SIP=7  EOF = 4/203       1 EXTS    5 SECTORS
SYS6/SYS       SIP=7  EOF = 13/33       1 EXTS    15 SECTORS

8 FREE GRANULES.      0 LOCKED-OUT GRANULES.

NEWDOS+   DIRECTORY CHECK & LIST COMPLETED.
```

(Note the Directory is listed in alphabetical order. Also THE AUTOEDIT/CMD is not normally part of NEWDOS+, it is AUTOKEY and QEDIT adapted for disk. Note also that the file extensions are given, and that disk space is now given in Sectors rather than in GRANS. The above listing was obtained by using the JKL function of NEWDOS. SYS11,12 and 13 are NEWDOS additions. SYS11 executes Basic direct command "RENUM" SYS12 executes Basic direct command "REF". SYS13 displays Basic's error messages.)

Figure 1

(Continued from page 10)

but it has already proven itself to be the best operating system now available for the TRS80. The capabilities provided in NEWDOS are a significant improvement over what Radio Shack now provides. The capabilities most used are the RENUM and the CMD execution from BASIC. They give the flexibility only dreamed of before (though I still miss the MAT commands from other BASIC dialects).

The utilities added with the PLUS maintain the high quality of the rest of the package. Anyone who has labored over the old Editor Assembler, limited to tape I/O even after he has his disk system, will appreciate in particular the improved EDTASM. The convenience of not only executing the program from disk, but keeping the assembly programs there as well as the assembled files will tickle you to the pink.

In short, if you have a disk system and you don't have NEWDOS, you are operating at less than the maximum capability now available. If you are still using the old EDITOR-ASSEMBLER, you are putting up with less than your disk system can give you. If you don't have SUPER-ZAP, you don't have the ability to look at and modify disk files in a convenient fashion. New improvements MAY come out any day, but we don't know of any just now. If you are waiting for something better, you may have a long wait. NEWDOS+ may well become the "standard" TRS80 DOS.

NEWDOS and NEWDOS+ are available from *Miller Microcomputer Services*, 61 Lake Shore Road, Natick, Ma. 01760. NEWDOS (without the utilities) is $49.95 and NEWDOS+ is $99.00; add $1 to either for shipping and handling, and Ma. residents add 5% tax. We strongly recommend the "plus" version, the utilities are outstanding.

NOTES ON BASIC

A little known page in the Level II manual (but a very valuable one if you use its suggestions), is page 11/1. It is loaded with tips for saving memory space. For example, if you are going to call a routine from different places in a program, then a GOSUB is the most efficient means for entering the routine, but if the call will always come from the same place, then a GOTO is more efficient (a savings of 6 bytes).

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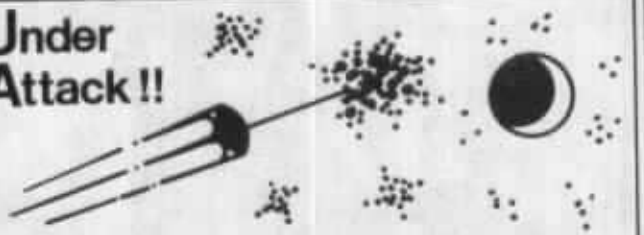

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THE GREAT TURN ON

Leo Christopherson
Tacoma, Wa.

As promised in our last issue, Leo has finally consented to recount for us the trials and tribulations of getting from SET and POINT graphics to such wonders as: Android Nim, Snake Eggs, et al. Hang on to your hats, while the "Guru of Graphics" takes us down the road the THE GREAT TURN ON.

Ever since I began programing my TRS80, I have been obsessed with a desire to see most of the screen turn on quickly. I've always felt there must be some use for this, although I'll have to admit I've never really needed a white screen which got that way quickly. Nevertheless, you may be heartened to hear of the twists and turns which led me to success. If nothing else, it shows what a very versatile machine we possess.

FOR NEXT LOOP

Of course, my quest began with the FOR-NEXT loop and SET POINT commands. That one goes something like this:

```
10 CLS
20 FOR Y=0 TO 47: FOR X=0 TO 127: SET
   (X,Y): NEXT X,Y
30 GOTO 30
```

As a first try, it was somewhat encouraging, but far too slow (about 45 seconds).

USING CHR$(191)

The next idea was to use CHR$(191) to turn the whole print area on in each of the 1024 positions. That looks like this:

```
10 CLS
20 FOR X=0TO1023:PRINT@X,CHR$(191);:
   NEXT X
30 GOTO 30
```

Not only was this also too slow (about 10 seconds), but it bumps the screen up at the end.

Then came the approach as suggested in the Level II Manual:

```
10 CLS
20 FOR X=15360 TO 16383:POKE X, 191:
   NEXT X
30 GOTO 30
```

This one looks pretty good, it certainly works...but it still takes too long, (about 7 seconds).

STRING$

When I first saw the STRING$ ( ) command, I thought this might do the trick:

```
10 CLS:CLEAR 64
20 X$=STRING $(64, CHR$(191))
30 FOR X=0TO960 STEP 64:PRINT@X,X$;:
   NEXT X
40 GOTO 40
```

This works faster, (about 0.6 seconds), but again, it jumps the screen up at the end. A second version of this one takes advantage of the potential string length of 255 bytes.

```
10 CLS:CLEAR255
20 X$=STRING$(255,CHR$(191))
30 FOR X=1to4:PRINT X$;:NEXT X
40 GOTO 40
```

This one also runs in about 0.6 seconds, but it leaves a small corner at the bottom right of the screen. This could be patched in, but I felt 0.6 seconds just wouldn't do anyway.

USR(0)

Sweet success has finally come in the form of a USR(0) machine level routine: LD-BC/16/64/LDHL/0/60/LDA/191/LD(HL),A/INC,HL/DJNZ/252
LDB/641DEC, C/JRNZ/247/RET. When the Z80 hex codes for the above commands have been converted to decimal so that they may be used in Level II Basic, the routine looks like this: 1/16/64/33/0/60/62/191/119/35/16/252/6/64/13/32/247/201. Now watch carefully! We say in basic:

```
10 X$=CHR$(1)+CHR$(16)+CHR$(64)+CHR$
(33)+CHR$(0)+CHR$(60)+CHR$(62)+CHR$
(191)+CHR$(119)+CHR$(35)+CHR$(16)+
CHR$(252)+CHR$(6)+CHR$(64)+CHR$(13)+
CHR$(32)+CHR$(247)+CHR$(201)
20 X1=PEEK(VARPTR(X$)+1):X2+PEEK
(VARPTR(X$)+2): POKE 16526,X1:POKE 16527,X2
```

Now we are ready to go. Any time in the program where the screen is to be turned on, just insert X=USR(0) and on it comes!

The first three commands load register C with a 16 count, to count the 16 rows on the screen, and register B with 64 for the 64 character positions in each row. The next three commands load the HL register pair with the address of the first position of the video memory. The next two commands load the A register with 191 which is the"All On" graphics character. The next command places the 191 in the first (or next) video memory position. The next command increments the HL address to the next memory position. The DJNZ/252 subtracts 1 from register B and if the result is not zero, jumps back to the LD(HL), A command. When B is zero, (and 64 191's have

been set across the screen,) the next three commands count down by 1 the number of rows left, reset register B to 64, and if the number of rows left in register C is not zero, jump back to the LD(HL),A command. When the last row has been done, the subroutine drops back into Basic with the RET command.

Line 10 actually creates a string, the elements of which are the machine level commands. Line 20 uses the VARPTR($) command to locate the beginning address of that string in memory. Then this address is poked into the address bytes of the USR(0) command.

USING NAME INSTEAD OF URS(0)

An even more elegant method to turn on the screen involves the "NAME" command which is built into Level II Basic but is not used. It may be appropriated for one's own use. Even in DOS this command is thus far not used, and remains available. Thus, the "NAME" command may be used as a vector to one's machine level programs, much as USR(0) in Level II may be used. But, unlike USR(0), the NAME command remains useable in DOS as well as Level II. (USR(0) will not work in Disk Basic, instead it uses USRx(X), where x = an integer between 0 and 9. The two USR functions are not compatible).

Two things must be observed: (1) the beginning address of the machine level routine must be POKED into the NAME location and (2) the programer must be sure to preserve the content of the HL register pair and restore this content just before exiting the machine level routine.

This last time around for the "turn on" routine, I will also illustrate embedding the subroutine as a string within the Basic program. This serves two major purposes. The first is that with the subroutine embedded in the Basic program as a string, no extra space is needed at the end of memory for a 'built-up" string, as was the case in the previous "turn-on" example using CHR$( )+. Space is saved, in that all the "CHR$ ( )+" business is not needed. Time is also saved, since when running the program the string does not have to be "put together" from CHR$( ) commands. Only the string's address needs to be recorded in memory. The second important advantage here is that the machine level routine may now be placed near the beginning of the Basic program. This is important if you wish your program to run in both level II and Disk Basic. The Disk Basic takes up a fair amount of the 16K and in a lengthly program, may cause the "CHR$( )" type of routine to be pushed beyond the first 16K of memory. This results in a memory addressing problem which make Disk Basic and Level II addressing imcompatible. So, as long as the "NAME" command points to a string address in about the first 5K of your program, the routines will work in both Level II and Disk Basic.

Now, on to the details of the great turn on. The first thing to do is to prepare a dummy string to hold memory bytes open for the machine level routine. Since the turn on routine now has 21 bytes, we will set X$ eaual to 21 periods (or any other character except the quotation mark, which is ASCII 34). A "34" would be read by the machine as the end of a string. And, by the way, the Z80 command "34D"D or "22"H, which is "LD(NN),HL", may not be used, and care must be taken so that addresses to be called , jumped to or pointed to will not contain a "34"D byte. Also, "0" may not be used, since this would look like the end of a line to Basic II. This rules out the Z80 command "0" or NOP. If a register has to have a "0" loaded from the subroutine, a "1" may be loaded, then the register may be decremented.

So we have, LINE 10 X$ = ".....". Next we have to be able to tell the machine where to find that first byte beyond the quotation mark which will be the first command of the machine level suboutine. Here we again use the "VARPTR()" command. LINE 20 X1 = PEEK(VARPTR (X$) + 1) :X2 = PEEK(VARPTR(X$) + 2):X0 = X2* 256 + X1. X1 is the decimal value of the least significant byte of the address of the first byte of the string and X2 is the decimal value of the most significant byte. Thus, X0 is the complete decimal address of the first element of X$.

The next job is to load this dummy string with the actual machine level values we wish to have there. A data line is set up with the decimal values for the machine routine. LINE 1000 DATA 229,1,16,64,33,1,60,45,62,191,119,35,16,252, 6, 64, 13,32,247,225,201

(Notice there are now more bytes in the turn-on routine. The first byte, 229, is PUSH HL and the next to the last byte is 225, or POP HL. These two commands preserve the content of the HL register pair, the need for which was already mentioned.The HL bytes are PUSHED onto the stack until needed, when they are POPED back into HL The other change occurs in the sixth and eight bytes. Here we have to have a "0" in the register L to complete the starting address of the screen, but we can't actually have a "0" in the string, as was mentioned before. So a "1" is loaded in L and L is decremented)

Next we set up a FOR-NEXT loop to POKE the DATA values into X$. LINE 1010 RESTORE: FOR N = 0TO22:READ D:POKEX0 + N,D:NEXT N:STOP This line will POKE each successive byte of data into X$, beginning from X0 which is the address of the beginning of X$.

At this point, all that remains to be done is to work up X = USR(0), or NAME, or perhaps LPRINT"0"; to vector in on X$ when called. To use USR(0) we would POKE 16526,X1 and POKE 16527,X2. ThenX = USR(0) would be used to call the subroutine. To use LPRINT"0" we would POKE 16422,X1 and POKE 16423,X2. Then LPRINT"0" would be used to call the subroutine. USR(0) has problems, as mentioned earlier, if the program is to run in both

Level II and Disk Basic. And LPRINT"0" can lead to a curious problem because of an echoed or repeated call of the subroutine when one breaks out of the program. Also, LPRINT"0" redirects the line printer driver to your subroutine and the printer will no longer work unless the original address is put back into locations 16422 and 16423.

So NAME looks best, since it has proven to have no serious drawbacks. For NAME to be used we would POKE 16783,X1 and POKE 16784,X2. Then just the command "NAME" is used to call the subroutine. We will add a LINE 30 POKE 16783,X1:POKE 16784,X2. At this point the NAME command is ready to go. Insert it in your Basic program whenever you need the screen to turn on. (of course, the program will have had to run once through lines 10 to 30 to set up the addresses for X1, X2 and NAME. You may have noticed that variables are lost during an EDIT or at the command RUN and must be recalulated.)

After the string has been packed, lines 1000 and 1010 may be deleted, since the machine level routine in X$ will record on tape or disk right along with the rest of the Basic program. The string will not have to be done again. Also, the X0 = X2*256 + X1 may be dropped from the end of line 20. So the whole program looks like this:

```
10 X$ = "....................."
20 X1 = PEEK(VARPTR(X$) + 1):X2 = PEEK(VARPTR
(X$) + 2):X0 = X2*256 + X1
30  POKE 16783,X1:POKE 16784,X2
1000 DATA
229,1,16,64,33,1,60,45,62,191,119,35,16,252,6,64,
13,32,247,225,201
1010  RESTORE:  FOR N = 0TO20:READ D:POKE
X0 + N,D:NEXT N:STOP
```

To test the routine you might set up somethng like this:

```
100 FOR N = 1TO100:NEXT N:NAME
110 FOR N = 1TO100:NEXT N:CLS
120 GOTO 100
```

These lines, in addition to the previously set up lines 10 to 30, will cause a repeating on/off blinking of the screen. When the program is listed, line 10 looks like this:

```
10 X$ = "PEEK@!X-XUSINGW#
```

Things look strange since the Basic is trying to list values less than 30 and greater than 127. That "PEEK" is the command "PUSH, HL" or 229. The "1" and "16" don't list at all. The "@" is the "64", and so on. Certain control characters can cause the listing to roll or "hop" when encountered. But , it all works when "RUN", so long as "0" and "34" are not in the string.

I feel sure that there are other routines in machine level which will do the job too, and perhaps more efficiently, but at least this one certainly works. And, -- I proved to the machine just who is the boss...I think●

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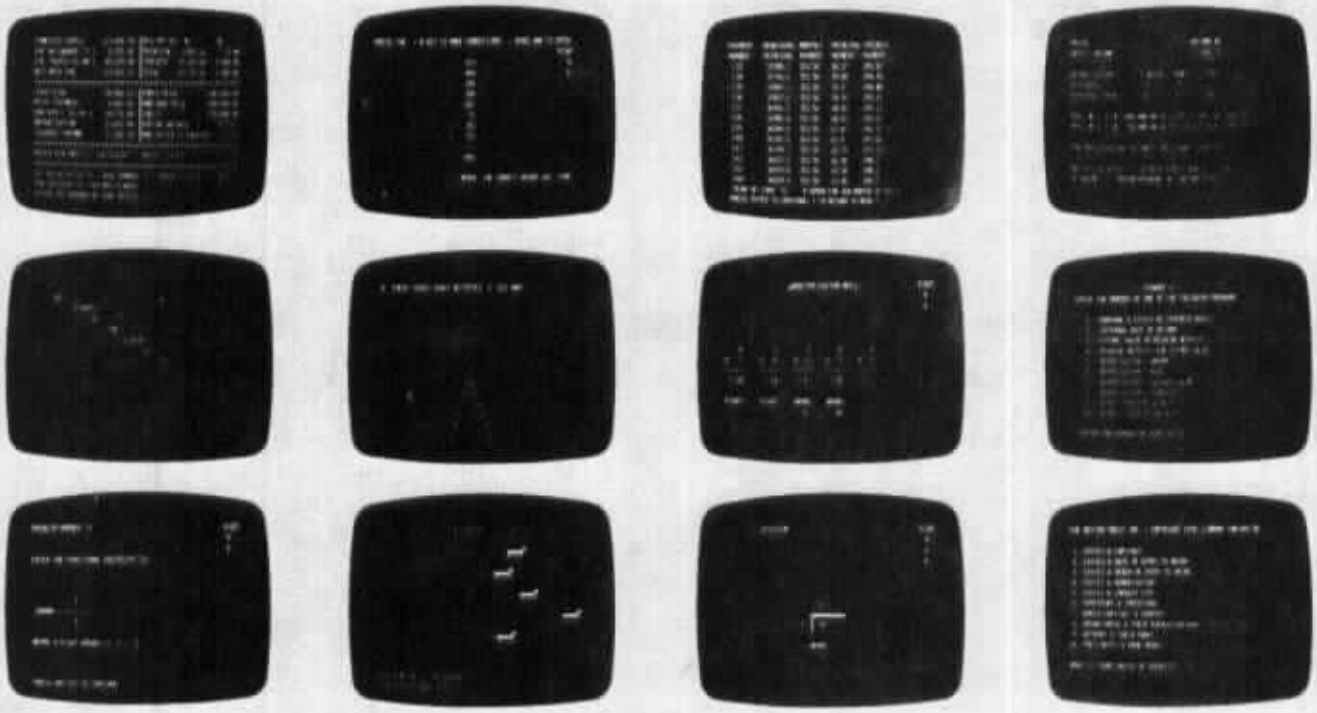

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MOVING UP TO LEVEL II

T. Dettman
Associate Editor

Here is a representative example of what to expect if you are converting from Level I to II. It may also provide a quick review for you "seasoned oldtimers", as well as a bit of nostalga.

Sooner or later every Level I user feels the need to have the Level II conversion done to his TRS-80. Marketing aside, there is only so much that you can do in Level I before you need the advanced capabilities of Level II. Every Level I user feels restricted at some time by having only 2 string variables and no string array capability, no expansion possible to disk or line printer and little formatting capability. All of these possibilities make the Level I owner haunt the store waiting for his new Level II package - hoping that it will be a cure-all (it isn't, but that is a subject for another article).

Since every Level I owner will probably move up to Level II, it would be useful to know some of the pitfalls in shifting to Level II. What can go wrong when making the conversion, and how can you prevent some of the problems from stopping you cold? Let's take a look at the problems I had. You may come up with some new ones, but you will likely run into most of these.

My problems started out when I first decided to step up to Level II. I had read that Level II had no abbreviations. This was something I thought I could practice. Don't do it! Much to my embarrassment, I found that the non-abbreviated words in Level I don't always match those in Level II, and what was more important, the tape conversion routine supplied to convert Level I to Level II didn't change anything but abbreviations. So in Level I, I was practicing "PRINT AT", but the conversion tape didn't change this to the proper Level II form: "PRINT @". So there I was, many of my programs would not run because of translation problems, which would have been solved had I not been so anxious to get ready.

Once my system came, my wife didn't see me for a week. I spent all of it locked in my study with the computer, trying out all the nice new commands. I learned the language fast, but also ran into one problem after another. It turned out that despite my efforts to "un-learn" Level I abbreviations, I still programed them into my Level II programs with alarming frequency. This led me to an immediate familiarity with another major difference in Level II, the error codes. From now on, the computer only gives you an error code ("SN" ERROR is an old buddy of mine - it's a syntax or spelling error) and a line number. They showed us where the error was in Level I, but since you are now more experienced, they thought it wasn't sporting to give you too much information. They added more detail about what the error was and removed information on where it is. When you have a long line which has several statements in it, finding one syntax error in it can give you grey hair rather quickly unless you took care to program with debugging in mind. Even then, as a corollary to Murphy's Law, I might suggest that it is a proven fact that any error pointed out by the computer in Level II is in all probability so obvious that you look straight at it for five minutes without realizing it is wrong. Until I got to know the error codes, I put a copy of them from the Level II manual by the computer for easy reference.

Which brings us to the subject of the manual. David Lien's Level I manual was a jewel. It led us through Basic as simply as can be. The Level II manual is another story altogether. Don't expect to be able to read the Level II manual, it isn't that kind of book. In fact it is set up as more of a reference manual which you can go to after you already know how to program in Level II. In other words, to use the book at all, you have to have already learned the material so you can find it and use it! To say the book needs work is an understatement. When you expand your system even further, you will find that the book will not expand with it. In fact, the manuals for the equipment you will add in the future will be even less readable. That is not too bad if you happen to be an old computer buff and know your way around, but the average user will not be able to get anywhere without effort.

The handiest thing I found was going through the book and trying each command in as many ways as I could think of to see what the limitations were.

Most of the recurring problems in converting to Level II were not with programing, they were with converting Level I tapes to Level II with the conversion program. In Level I, I used the expression "TAB (10),A" in my print statements, but the comma isn't taken out by the conversion program and Level II gives a syntax error when it is there. Until I found that comma, my graphics which relied on TAB's just didn't work right on Level II. Also, if you are in the habit of leaving spaces between the "TAB" command and the parens(ie, TAB (19) instead of TAB(19), you will get a "BS" error (subscript out of range). You can spend all day looking for an array, or correcting one that happens to be on the same line before you find that it is not the array at all.

Since I didn't have a printer on which to list programs, the best way to debug the programs was to run them right after conversion, and force them to take each option available. In this way, when I came to an error, the program stopped at the line, gave me an

error code, and let me fix it. Starting execution again took me to the next error. Continuing this process allows one to clear the program of errors prior to CSAVEing the program.

I found the data conversion tape provided to be just too much bother to even try. For a very short data tape, it would probably work OK. But I had some rather large data files on tape, and the conversion program requires that you read in one data record, remove the tape, put in a new data tape, record the data record, remove the new tape, put in the old tape, read in another data record, and so on. This was just too much ridiculousness to bear. I was able to reconstruct my data tapes faster by typing them in from the keyboard.

A clearly noted problem is the matter of tape recorder volume, especially during tape conversions. Level II tapes are recorded and read at a lower volume setting (4-5 for Level II, compared to 7-8 for Level I). This means that you must change the recorder setting before each tape. If the recorder is set too low because you just recorded a Level II tape, and you try to read in a Level I tape, the conversion program will not indicate an error, but when you list the program you will get garbage. You can handle the problem in two ways; one is to modify the conversion routine to tell you to check the recorder setting, the other is simply to make a sign for your TRS-80 which says "RECORDER VOLUME". Once you have finished with the conversions, you will rapidly become accustomed to the proper Level II settings for the recorder.

Be sure to read the tape conversion book before trying a conversion. The last few lines in the conversion routine section tell you how to load the conversion tape so you can execute it for more than one Level I tape (that's what the "MEMORY SIZE?" question is for!). An experienced Level II user finds this trivial, but when converting from Level I, the problem is a real one.

Once you have completed your first tape conversion, you are in for another surprise. Since you have programed Level I, you probably didn't pay much attention to the "LIST" command when you went through the reference manual. So you want to see the program you just converted and you type "LIST" and press enter. Stand by for a good show and watch the program statements fly by at a rate which prevents reading them. Level II does not page the listings or allow single stepping. Instead, just typing "LIST" will cause the lines to run by. It turns out that there are two useful ways to stop the listing so you can see it. The first (and nicest) is to press "SHIFT @", which stops the execution of any command including a list, and causes the display to freeze. You can restart the list by pressing any key. It seems to work best if you keep two fingers set on the right side shift key and the @ key. Press shift all the time, and press @ to start and stop the display. You can also list a small portion of the program (say lines 100 to 200) by typing "LIST100-200". This will list only those lines. Be careful though, the screen lists only 16 lines, if there are more than that between 100 and 200, you will only see the last lines. The system also prints a "READY" After the last line, so make room for that when you choose the range of lines.

If you have only programed in Level I Basic, it will take some time to get used to the array capability in level II. It is a powerful way to store and use numbers. However, the first time you use a large (more than 11) array or convert one from Level I, you will run directly into a new statement (and a new error code), the "DIM" statement. With Level II you have to tell the computer to set aside space for arrays larger than 11 elements. To do this you put the maximum number of elements in a dimension statement like this: DIMA(100)
which tells the computer to leave 100 spaces for array A. If you don't do this and you ask to put something in array space 11 or higher, you will get BS error.

String space is also a problem in Level II. The computer makes 50 spaces of string space available automatically, but if you are going to need more, you have to execute a "CLEAR" statement. To do this, you decide how much string space you will need, and then execute "CLEAR1000" for example, to clear 1000 memory locations for strings. Be careful to put this statement before all other statements in your program. If you put it after a dimension statement or after you have values stored in memory, you will lose the dimensions or the values since "CLEAR" wipes memory clean. If you put a clear statement in the middle of a program, you will be stopped at the first calculation after the clear.

The first facility I rushed to try when I got my Level II system was the AUTO line numbering. Just think, the computer would keep track of my line numbers! The one thing which is not really pointed out is that the line you type in is not there in program memory until you hit enter. If you type a line and then hit break to end the auto function, you will lose the last line. When you use "AUTO" to insert lines inside a program, an "*" will appear to tell you a line already exists with that number. If you then hit BREAK, the old line will still be there.

If you use graphics, you will have to get used to the screen limits in Level II. In Level I you could write graphics which wrapped around the screen, but in Level II it will get you another error corde (FC Illegal Function Call). You will need to reprogram any effects which rely on the wrap around screen.

Speaking of graphics, everyone with Level II should run the program on Page C/2 of the manual. It shows you the capability of the graphics blocks with CHR$ and ASCII characters.

From the very start, get yourself into the habit of verifying your tapes using the "CLOAD?" capability. Level I didn't have a way to do this. CLOAD? gives you confidence that your tapes will be good.

If any of your programs are designed to run at steps inside the program, allowing you to set variables before you execute, or if you check out program operation by running steps until you find an error and then running from the point where the error occured, you will be in for a shock. In Level II, each time you type "RUN", the system automatically executes a "CLEAR" and resets all variables to zero. You can get around this in several ways. First, you can build in error checking routines at standard locations which assume variables are set to zero. These routines can establish the variables they need, and then check out your program execution as desired. You can also resume execution of the program without losing your variables by executing a "GOTO" in command mode, directing execution to the step you want to begin at. You can even stop a program in execution, modify some variables, and then execute a "GOTO" to whatever place you wish to restart execution.

Still another useful feature in Level II is the TRACE capability which you get by executing "TRON". When you start a trace, it lists the line numbers as they execute in the program. You can use the statement inside a program or in command mode. Once started, it will not stop until "TROFF" is executed. You can follow the execution of loops in a program, or follow the path of logic through a series of steps to see just how your program logic handles a condition. Be careful though, it fills up the screen very fast when you have a large loop with the trace on.

The last capability of Level II I want to mention is the Editor. This one feature of the system will get more use than any other. Nearly every program will have typos or outright errors to correct and the EDIT mode is the right way to do the corrections. I found that in changing that I became locked into a small set of instructions which I used repeatedly. For example, I started using the "S" and "H" commands frequently enough to remember them. "S" does a search, "H" deletes the rest of the line and puts you into the insert mode. After a while, I found myself using "S" to skip to the end of the line by asking it to search for a letter I knew was not in the line. Then I would press "H" (even though "I" for insert, would have been more logical). This process is inefficent, since a single command, "X", will automatically accomplish this. I decided that it would be a good idea to list the commands and a one line description on a sheet of paper, placed near the computer for easy reference.

Every day I learn more about Level II. I think you will find your conversion to Level II to be similar to mine, full of large and small errors, goofs, and plenty of practical proofs to one of the corallaries to Murphy's Law, "If everything seems to be going well, you have obviously overlooked something." You will also have a lot of fun with Level II●

A note on disk basic

Level II BASIC is much more efficient than Level I, but there are many things that can be done to improve the efficiency of a program. Page 11/2 in the Level II Manual lists 6 methods for improving program execution speed. If this is important to you, then you should read the page carefully.

The most important method is the use of integers for loop indices (covered in another note), but another very important method for speeding up execution is to use variables instead of constants in expressions. It turns out that it is faster to find a variable than to convert a constant to the proper form for use in mathematical expressions.

.....

Here are some more interesting routines available to DOS users:

4043 address of the highest usable location in memory
4047 address of the lowest usable location in memory

TRS 80

DOOM CASTLE

Journey to Doom Castle to find treasure, weapons and monsters and then try to get back "Alive" to spend your loot.

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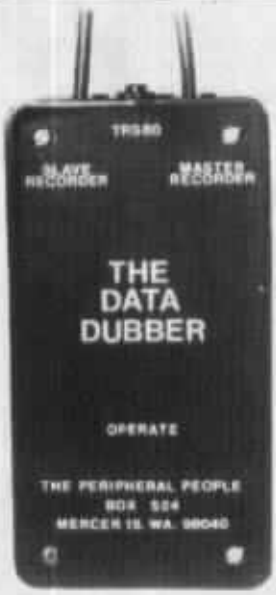

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WIN 21

The ad said, "What, Another Blackjack Game?!", and that is precisely what I thought the first time I saw it. But hold on! It's not really a game at all. It is a complete tutorial program for helping you improve your playing skills.

In the preface to the instruction booklet which comes with this program, the author placed the following:

Sucker: "Is this a game of chance?"

W.C. Fields: "Not the way I play it, no."

(From W.C. Fields in "My Little Chickadee".

Well, mid-summer madness and vacation time are upon us. Perhaps you will want to try your luck in Atlantic City or Vegas. This program will help you sharpen your skills at Blackjack. It comes on a 16K Level II tape, with a booklet by the author and includes a softcover, 220 page book entitled, "Beat the Dealer", by Edward O. Thorp.

The program is easy to use, and prompts you all the way (see figure 1). There is considerable use of graphics and the cards actually seem to "flip" over on the screen.

Aside from all that though, you can specify exactly the kind of practice you wish. With or without help from the program. You can play more than just one hand at a time, and with up to 4 decks of cards. You can specify that hole cards be dealt face up, that Blackjacks be turned up immediately upon being dealt, whether or not the dealer show the "Burned" card, and much more. You can practice 4 different types of strategy, with several levels of assistance.

If you are really interested in learning to play Blackjack to win, you could spend much more than this program costs for a private tutor (and the computer won't even snicker at your goofs!). The program offers both the precision that practicing without coaching lacks, and the infinite patience which no tutor can hope to provide. This does not mean that WIN 21 will permit effortless mastery of the game. But it does mean that your efforts should lead to learning more efficiently.

The program, instruction booklet and the book by Dr. Thorp are available from *Discovery Bay Software*, P.O. Box 464, Port Townsend, WA. 98368. The price is just $29.00.

```
WIN21: A PRACTICE AND TUTORIAL PROGRAM FOR WINNING BLACKJACK
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A. HOW MANY DECKS (1, 2, 3, OR 4)? 2
B. HOW MANY HANDS DO YOU WANT TO PLAY? 3
C. HOW MANY PLAYERS ON YOUR LEFT? 2
D. HOW MANY PLAYERS ON YOUR RIGHT? 2

E. SHALL PLAYERS' HOLE CARDS BE DEALT UP (Y OR N)? Y
F. SHALL ALL BLACKJACKS IMMEDIATELY BE TURNED UP (Y OR N)? Y
G. SHALL DEALER SHOW THE BURNED CARD (Y OR N)? Y
H. MAY ACES BE SPLIT (Y OR N)? N
I. SHALL DOUBLING DOWN BE WIDE OPEN (Y OR N)? N
     OKAY.  YOU MAY DOUBLE DOWN ONLY ON 10 OR 11.
J. SHALL INSURANCE BE OFFERED (Y OR N)? N

K. WHICH STRATEGY DO YOU WANT TO PRACTICE?

     1. BASIC STRATEGY.
     2. FIVE COUNT STRATEGY FOR BET SIZE.
     3. SIMPLE POINT COUNT STRATEGY FOR BET SIZE.
     4. COMPLETE POINT COUNT STRATEGY.

     WELL?...
```

Figure 1

VIEW FROM THE TOP OF THE STACK

T. Rosenbaum
Technical Editor

The stack is widely used for temporary storage of the operating registers) AF,BC, DE, HL, IX,IY). When a subroutine is CALLed, any information in the operating registers which is required for proper program operation upon returning, must be stored somewhere so that the subroutine can use the operating registers without bombing the program.

Consider the following example: You have built a program which will transfer 512 bytes of data from one section of memory to another. You have also built a subroutine which will detect when 256 bytes have been moved and will add 80 (hex) to the last 256 bytes moved. Your program uses the HL register pair to store the address of the current byte being moved, the DE register to store the address to which the current byte will be moved and the C register to store the value of the current byte. If the contents of the C, DE or HL registers are changed in your subroutine, your main program will bomb when you return to it. You can prevent this by storing the contents of these registes in RAM before executing the subroutine and reloading the registers from RAM before leaving the subroutine. The easiest way to do this is to PUSH the registers onto the stack immediately after you have entered the subroutine, and POP them off just before leaving it. A general example follows:

```
        CALL SUBR
SUBR    PUSH AF
        PUSH BC
        PUSH DE
        PUSH HL
        PUSH IX
        PUSH IY
        .
        .
(subroutine code)
        .
        .
        POP IY
        POP IX
        POP HL
        POP DE
        POP BC
        POP AF
        RET
```

The subroutine code may use any of the operating registers without fear of harming the main program. If the subroutine does not use some of the operating registers, it is not necessary to store their value on the stack. However, you must beware CALLs into the Level II ROM unless you know which registers the Level II ROM subroutine is using.

Note in the above example that the order of the registers POPed off the stack is the exact reverse of the order they are PUSHed onto the stack. This is because the stack operates on the Last In-First OUT (LIFO) principle.

PROJECTS from previous issues

1. The first project involved building a program which would print all of the letters of the alphabet on the screen. The most effecient way to do this is to load the ASCII code for the alphabet (41H-5BH) into the appropriate locations in the video RAM (3C00H-3CFFH) with the DJNZ instruction.

```
        LD      BC,1,AH     ;set up for 26 characters
        LD      HL,3C10H    ;store at 3C10H
        LD      A,41H       ;ASCII A
LOOP    LD      (HL),A      ;store to screen
        INC     HL          ;next display position
        INC     A           ;next letter
        DJNZ    LOOP        ;loop thru 26 letters
```

2. The second project was to develop a program which will print every other letter of the alphabet. This program is very similar to the above.

```
        LD      B,0DH       ;set up for 13 characters
        LD      HL,3C10H
        LD      A,41H
LOOP    LD      (HL),A
        INC     HL
        INC     A
        INC     A           ;every other letter
        DJNZ    LOOP
```

3. Finally we had to make a program to put ten "A"", ten "B's" and ten "C's" on the screen in consecutive order starting at 3C50.

```
        LD      HL,3C50H    ;store at 3C50H
        LD      B,0AH       ;ten characters
        LD      A,41H       ;ASCII A
LOOP1   LD      (HL),A      ;store to display
        INC     HL
        DJNZ    LOOP 1      ;loop ten times
        LD      B,0AH
        INC     A           ;ASCII B
LOOP2   LD      (HL),A
        INC     HL
        DJNZ    LOOP2
        LD      B,0AH
LOOP3   INC     A ;ASCII C
        LD      (HL),A
        INC     HL
        DJNZ    LOOP3
```

PROJECTS FOR NEXT ISSUE

1. Build a subroutine which will put n (where n is equal to or greater than zero and less than 256) characters on the screen. Assume that when the subroutine is CALLed, the opeating registers contain the following information:

A ASCII code of character to be put on screen.
HL Starting address of n characters in the video memory.
B Number of charactes to be printed on the screen.

2. Build a main program which will use the subroutine developed above to print: 15 "A's" at 3C20, 137 "B's" at 3C60 and 36 "Z's" at 3E20.

3. Predict what the following section of code will do:

Address	
7000	CALL 7003
7003	CALL 7000

The contents of the SP are 0000.●

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STEVEN'S SOFTWARE has the disk oriented Text Pencil. A few of the features are right justification, search for word or phrase and variable columns. $20.00 on formatted diskette, $18.00 on cassette tape, $15.00 on user supplied DOS. Steven's Software, 9005 East Vickery Rd., Tacoma, WA 98446.

TRS-80 YELLOW PAGE on hardware & software. Send $1.00 plus 2 SASE for 2 issues. Vendors send $20.00 & product description. 96 Dothan St., Arlington, MA 02174.

TELETYPE USERS: Unique solid state time delay relay. Reduces energy and maintenance costs. Info. 50¢, plans $5.00, with PC $10.00. Keith Ryan, Box 3103-J, Ottawa, Ontario, Canada K1P 6H7.

TRS-80/LEVEL II install a Clock Control Board and speed up your operation by 50%. Unlike other clock mods, this one allows use of your present software, it lets you change speed while a program is running, and it does not require a special control switch. Speed is changed with the "OUT" statement. Assembled circuit card + everything required for easy installation: $24.95. SASE for more info. Bill Archbold, 106 Snyder Dr., Mather AFB, Ca. 95655 (916)362-3627.

TRS-80 USERS IN EUROPE We sell a great number of games, educational and scientific software, and a "TRS-80 Resource Book" with programing tips, hardware/software information. Send stamped envelope for more details. VORTEX80 Postfach 401606, 8 Munich, West Germany.

TRS-80 ORIGINAL PROGRAMS: Business, games, educational, graphics. 50 for $25.00. L1 or L2 ppd in US, no COD. SASE for complete list. Jensen Software, 1589 Blossom Park, Lakewood, Oh. 44107.

ADVENTURE FOR TRS-80 $14.95 per adventure or send SASE for flyer. 3 adventures currently available. M. Scott Adams, P.O. Box 3435, Longwood, Fl. 32750.

WE HAVE AN RS 232 serial interface, plug compatable with TRS-80 Exp interface with software & instr. Precision Electronics, 3411 S 90th St. Tacoma, WA 98409.

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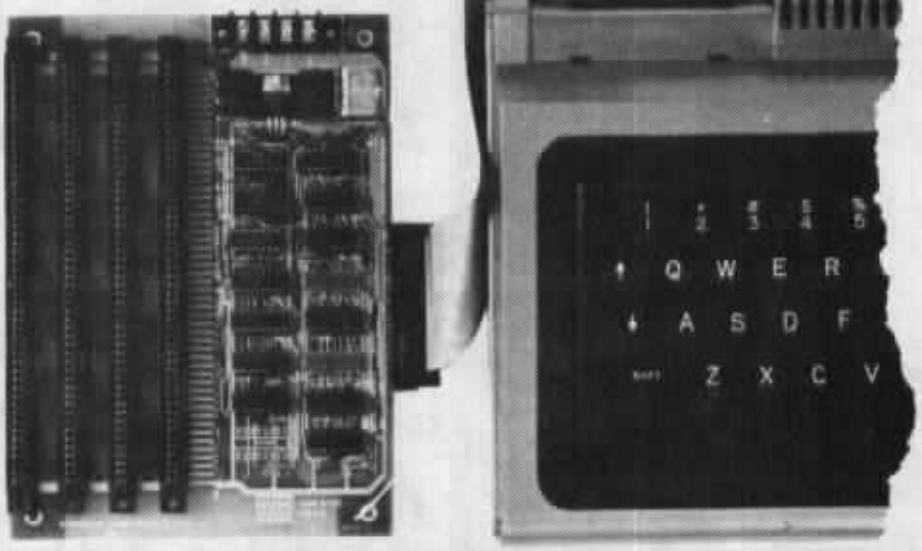

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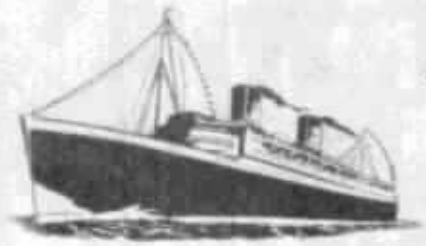

lifeboat

This 16K Level II program was built on the concept of an old Alfred Hitchcock movie. There are a few additions, however, (like the captain having the option of "doing in" the passengers) to make the game more interesting. You are basically at the mercy of fate, but you do have a small, very small degree of control over your destiny. Go ahead, take a ride on the Titanic–

Karl K. Jahns
Allyn, Washington

```
10 REM * (C)1979 80-NW PUBLISHING CO *
20 REM * CREATED FOR 80-US BY KARL JAHNS, ALLYN, WA *
30 PRINT:PRINT
40 CLS:PRINT:PRINT:PRINTTAB(27);"LIFEBOAT"
50 PRINT:PRINT
60 PRINT:INPUT"WHO IS THE CAPTAIN";A$
70 CLS:PRINT:PRINT:PRINT"YOUR SHIP HAS BEEN WRECKED.  YOU ARE AMONG TEN
80 PRINT"SURVIVORS.  YOU HAVE 60 SMALL PORTIONS OF WATER.  (1 PORTION"
90 PRINT"PER PERSON PER DAY)  YOU ARE ABOUT TEN DAYS FROM LAND.  THERE"
100 PRINT"ARE THREE SURVIVORS WHO ARE SICK SO FAR. WEATHER IS UNCERTAIN"
110 PRINT"AS IS THE POSSIBILITY OF CHANCE RESCUE."
120 PRINT:PRINT"YOU MUST DECIDE IF SOME WILL HAVE TO BE KILLED TO BETTER
130 PRINT"THE CHANCES FOR THE REST SURVIVING. (YOU HAVE THE REVOLVER)
140 PRINT"YOU DO RISK TRIAL FOR MURDER IF YOUR DECISION WAS HASTY, BUT
150 PRINT"YOU COULD ALL DIE OF THIRST OR EXPOSURE IF YOU MISJUDGE"
160 PRINT"YOUR CHANCES.":GOSUB1500
170 CLS:PRINT:PRINT:PRINT"YOU HAVE A DIARY IN WHICH YOU MAKE ENTRIES ON
180 PRINT"THE HAPPENINGS OF THAT DAY. (OF COURSE, HITCHCOCK WILL MAKE A"
190 PRINT"MOVIE OF THESE ENTRIES IF THE BOAT IS EVER FOUND.)  AFTER THE
200 PRINT"ENTRY IS MADE YOU MUST MAKE THE DECISION OF HOW MANY TO SHOOT."
210 PRINT:PRINT"SICK PEOPLE NEED 2 RATIONS OF WATER PER DAY."
220 GOSUB1500
230 CLS:PRINT:PRINT:PRINT:R=10:K=0:L=0
240 R=10:L=0:K=0
250 F=60:N=10:S=3:B=0
260 T=1:I=0:P=0:W=0
270 CLS:PRINT:PRINT"     - - - - - - - - - - - - - - - - - - - - - - - - - - - - - "
280 PRINT"CAPT. ";A$;"'S LOG:                              *  DAY  ";T;" *":PRINT
290 IFK>0THENN=N-K:S=S-K
300 IFK>0THENW=1:P=T
310 IFS<0THENS=0
320 P=P-N-S
330 IFT>=RGOSUB1350:GOTO520
340 RANDOM:X=RND(13)
350 IF(X=1)*(S>=1)THENN=N-1:GOSUB760
360 IF(X=1)*(S<1)GOSUB1090
370 IF(X=3)*(S>1)GOSUB790:GOTO390
380 IF(X=3)*(S>=1)THENN=N-1:GOSUB760
390 IF(X=2)+(X=4)+(X=10)GOSUB1290
400 IF((X=2)+(X=10))*(T>2)GOSUB1300
410 IFX=6GOSUB1220:R=R+1
420 IFX=8GOSUB1260:R=R+2
430 IF((X=5)+(X=7))*(L=1)GOSUB1370:GOSUB730:GOTO450
440 IF(X=5)+(X=7)THENR=R-1:GOSUB1370:L=1
450 IF(X<>5)*(X<>7)THENL=0
```

```
460 IF(X=13)*(T-P=0)GOSUB650:GOTO610
470 IF(X=13)*(T-P<>0)GOSUB710
480 IFX=9GOSUB910
490 IF(X=11)+(X=12)GOSUB940
500 IFF<1THEN840
510 IFT>=RGOSUB1350
520 IFS<0THENS=0
530 IFN<0THENN=0
540 IFS>NTHENS=N
550 IF(I=1)*(W=1)GOTO1000
560 PRINT:PRINT"WE HAVE ";F;" UNITS OF WATER LEFT."
570 PRINT"THERE ARE ";N;" OF US LEFT AND ";
580 IFS>1PRINTS;" ARE SICK."
590 IFS<2PRINTS;" IS SICK."
600 PRINT:PRINT"I ESTIMATE ";R-T;" MORE DAYS TO LAND."
610 PRINT:PRINT"     - - - - - - - - - - - - - - - - - - - - - - - - - - - - - "
620 IFN<1PRINT"P.S.  AHHHHHH!   THEY ALL DIED!   WELL, THAT'S LIFE.":
    GOTO1120
630 PRINT"(CAPT.";A$;", HOW MANY ARE YOU GOING TO SHOOT TONIGHT)";:
    INPUTK
640 T=T+1:GOTO270
650 PRINT:PRINT"THIS IS MY LAST ENTRY. IN TRYING TO SHOOT MRS. O'BRIAN
660 PRINT"LAST NIGHT, I HIT THE LIFEBOAT.  WE'RE SLOWLY SINKING.
670 FORX=1TO900:NEXTX
680 FORY=1TO5:GOSUB690:GOSUB700:NEXTY:N=0:RETURN
690 PRINTTAB(0+10*Y);"GLUG !":PRINT:RETURN
700 FORX=1TO200:NEXTX:RETURN
710 PRINT"TODAY WE SAW SMOKE IN THE DISTANCE.  IT WAS EITHER A SHIP OR
720 PRINT"SOME CRAZED INDIANS.":RETURN
730 IF N<1 GOTO620
740 PRINT:PRINT:PRINT"WAIT ... A SHIP ON THE HORIZON.  WE'RE SAVED!!"
750 I=1:RETURN
760 PRINT"ONE OF OUR SICK PEOPLE DIED.  WE THREW THEIR BODY OVERBOARD"
770 PRINT"TO APPEASE THE SHARKS."
780 S=S-1:RETURN
790 IF N*(R-T)>F THEN820
800 PRINT"ONE OF THE SICK GOT SO EXCITED AT BEING CLOSE TO RESCUE THAT "
810 PRINT"HE HAD A HEART ATTACK AND DIED...POOR SLOB !":
    S=S-1:N=N-1:RETURN
820 PRINT"TWO SICK PASSENGERS STRANGLED EACH OTHER SO THE REST OF THE
830 PRINT"PASSENGERS WOULD HAVE A BETTER CHANCE.":S=S-2:N=N-2:RETURN
840 PRINT"OUR WATER IS ALL GONE.  WE CAN ONLY LAST ONE MORE DAY."
850 PRINT:INPUT"           (PRESS 'ENTER' TO CONTINUE)";G$
860 IF(R-T)<2GOSUB730:GOTO950
870 G=RND(R-T):IFG=1GOSUB730:GOTO950
880 FORX=1TO25:PRINT" /";:NEXTX:PRINT
890 PRINT"THEY DIDN'T MAKE IT.     EVERYONE DIED !":PRINT:PRINT
900 N=0:GOTO1120
910 PRINT"THERE WAS A RAIN SHOWER TODAY.  WE WERE ABLE TO CATCH ENOUGH"
920 PRINT"WATER FOR ONE MORE DAY."
930 F=F+N:RETURN
940 PRINT"ANOTHER MONOTONOUS DAY.  HO HUM...NO CHANGE IN SITUATION.":
   RETURN
950 PRINT:PRINT"GALA BALL IN THE GOVERNOR'S MANSION TO CELEBRATE YOUR
960 IFN=1GOSUB1040:GOTO1120
970 PRINT"COURAGEOUS SHEPARDING OF AS MANY OF THE FLOCK AS COULD HAVE
980 PRINT"BEEN SAVED."
```

```
990 PRINT:PRINT"                                YOU'RE  A  HERO  !!":GOTO1120
1000 PRINT:PRINT" * * *
```

PRACTICAL MICROCOMPUTER PROGRAMING: THE Z80

BOOK REVIEW: T.R. DETTMAN

W.J. Weller

W.J. Weller
Northern Technology Books, 1978
(Price: $29.00)

Practical Microcomputing Programming is a continuation of a series of books by the same name (previous volumes cover the 8080 and the 6800). It is intended to be a text for the beginning programmer on the Z80 system and indeed covers that subject well in 18 chapters and 4 appendices (481 pages total).

It is a major difficulty with the book that the author chose to disregard the standard Z80 assembly language and instead teach an extension of the popular 8080 assembly language mnemonics. This makes the programs in the book incompatible with the TRS80 Editor-Assembler.

Mr. Weller points out that he feels that Zilog made a mistake in writing a new set of mnemonics for the Z80 instead of maintaining full compatibility with the 8080. For this reason, we are to learn 8080 mnemonics since we will then have access to 8080 programs. This is admirable, but doesn't take into account the problems with translating Z80 programs to the new system.

To solve the problem of incompatibility, he provides a complete Editor-Assembler and Debugging monitor listing in the back of the book which is compatible with the book's mnemonics. Further, copies of the Editor-Assembler and Debugger are available on paper tape for free with purchase of the book.

What good is all this to the TRS80 user, you ask? Well, realistically, very little. In the first place, a TRS80 user would have to modify the Editor-Assembler to use it on his machine, but to do that he would already have to be a competant machine language programmer. Specifically, the I/O for the editor assembler assumes paper punch tape and nothing in the first 12K of memory. This is obviously not the TRS80.

So how about using the book with the TRS80 Editor-Assembler? Well, the mnemonics are not the same. The TRS80 Editor-Assembler uses Zilog mnemonics while he uses an expanded 8080 set. Someone who is trying to learn Z80 programming would have a hard time trying to keep the differences from interfering with his learning.

Running the programs on the MAC80 assembler would also get to be a problem since the extension of the Z80 code isn't recognized by this assembler. So why bother with the book at all? Well, there are some possibilities.

In the first place, Mr. Weller has put a lot of good assembly language programming into the book. More importantly, he has explained the programming in great detail. In sample programs, most steps have explanations to show what it is doing as part of the program.

In nicely shows off the capabilities of the Z80 as compared to the 8080 in many places, by pointing out specific things that the Z80 can do better. For instance, his example 10-6 gives a listing for a bubble sort that uses the Z80's index plus displacement addressing capability to shorten the program compared to the 8080.

Practical Microcomputer Programming is an excellant text on Assembly language programing, hampered only by the fact that its assembler will not run as is on the TRS80. Someone who is trying to learn assembly language programing could use the book to learn how to do it, but then a second book would be needed to use the Editor-Assembler currently available on the TRS80.

Most TRS80 users will find William Barden's book on the Z80 more directly applicable to the software they use. However, Mr. Weller's book can have a useful place on your shelf as a guide to advanced techniques if you are willing to translate to normal Z80 code AND pay the price for the book.●

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STOCK PROGRAM

(DOS and printer required)

The first of a three part series

Fred Guth & John Knoderer
St. Louis, Mo.

The co-author of these programs, John Knoderer, and his COMPUTER-VAN, travel full-time from TRS-80 owner to TRS-80 owner in the Missouri-Kansas area helping with custom software needs and other programing services. One of this many addresses is P.O. Box 22169, St. Louis, Mo. 63116.

This is the first of a set of three stock programs, and is a program to inventory and evaluate investments in stocks. Upcoming issues will contain a program to determine rates of return on stocks and a program to determine net amounts received and taxes to be paid when selling.

What stocks to keep? What to sell? Has a stock moved consistently with the market? What are the relative yields and if sold, what is the net after tax? These questions add up to a lot of work when using a pencil and paper, and the longer the list of stocks, the more difficult it is. But the computer has lifted a burden. Now you can see more clearly, and you can move when the time is right!

The filename of the first program is STOCK/PRO, meaning stock program. It keeps a current inventory of any set of stocks. The example with this article merely shows the type of printout. Although basically designed for the Centronics printer at 132 characters/line, it can be used with other printers which will take 15 inch paper (or have sufficiently variable pitch).

Note that each stock is numbered. This is done automatically by the program, and one must use these numbers when changing or deleting a listing.

The program is designed for disk and printer, and after entering Basic, be sure to enter 15 for the numbr of files question.

After the date is entered, a table of options appears. What do you want to do?

1-Add a stock to the file
2-Change a listing
3-Change all market values
4-Print out a list of all stocks on hand
5-Delete a stock
6-Quit the program
CHOOSE?

To begin your own stock file, type in 1, add a stock to your file.

(Editor's note: We didn't find this to be entirely true. The program opens a data file called STOCK/FIL. If there is no information at all, the program gives an error. To get around this, enter the first stock using option 2, changing the null values for the stock to those you wish to enter. After the first stock is entered you may use all the options as shown.)

The stock name may be up to nine characters, including the spaces and periods.

When adding a stock, you make just four entries, the program extends the unit costs into total, the market price into total market, totals costs and markets and prints out the individual gains and losses as well as a recap.

Option 3 allows you to enter update market information from your newspaper. This can be done as often as you wish to update. You can then compare new information with the previous period and make decisions as to which way to move.

In the next installment, we will present STOCK YIELD, which will allow you to see a quick analysis showing all the returns on your various holdings, based both on cost and current market price.

STOCK VALUES AS OF 04/04/79

ST ##	STOCK.... NO.OF .....NAME	SHARS	UNIT..$ ...COST	TOTAL COST	UNIT..$ .MARKET	TOTAL..... .....MARKET	GAIN//LOSS
1	C H ENTR	375	$210.67	$79,001.25	$210.67	$ 79,001.25	$ 0.00
2	LIGGET	200	$ 31.64	$ 6,328.00	$ 36.37	$ 7,274.00	$ 946.00
3	MOR NORW	800	$ 1.30	$ 1,040.00	$ 28.87	$ 23,096.00	$22,056.00
4	P G & E	1000	$ 14.30	$14,300.00	$ 22.12	$ 22,120.00	$ 7,820.00
5	WAR LAMB	2500	$ 1.37	$ 3,425.00	$ 22.12	$ 55,300.00	$51,875.00
6	AM BRANDS	250	$ 28.90	$ 7,225.00	$ 48.75	$ 12,187.50	$ 4,962.50
7	EXXON	300	$ 53.85	$16,155.00	$ 49.25	$ 14,775.00	$-1,380.00
8	INT HARV	175	$ 32.50	$ 5,687.50	$ 37.50	$ 6,562.50	$ 875.00
9	NABISCO	250	$ 20.75	$ 5,187.50	$ 23.50	$ 5,875.00	$ 687.50
10	TEXACO	500	$ 22.50	$11,250.00	$ 27.75	$ 13,875.00	$ 2,625.00
11	ZENITH	350	$ 49.75	$17,412.50	$ 25.78	$ 9,023.00	$-8,389.50
TOTAL FIGURES				$167,011.75		$249,089.25	$82,077.50

TOTAL GAINS $91,847.00
TOTAL LOSSES $9,769.50

Figure 1

```
10 REM * FILENAME IS STOCK/PRO *
20 REM * PROGRAM FOR LISTING & REVIEWING STOCK INVESTMENTS *
30 REM * WHEN 'HOW MANY FILES' IS ASKED, ANSWER 15 *
40 REM * (C)1979 JOHN KNODERER, ST LOUIS, MO *
50 IFLEFT$(TIME$,2)>"00"THEN90ELSEINPUT"MONTH(ONLY)OF THIS
```

```
    REPORT(MM)";M:IFM<1ORM>12THEN50ELSEPOKE16454,M
60 INPUT"DAY (DD)";D:IFD<1ORD>31THEN60ELSEPOKE16453,D
70 INPUT"YEAR (YY)";Y:IFY>1900THENY=Y-1900
80 IFY<0ORY>255THEN70ELSEPOKE16452,Y
90 CLEAR999:DEFDBLA-H,K-Z:OPEN"R",1,"STOCK/FIL"
100 CLS
110 INPUT"WHAT DO YOU WANT TO DO?
1-ADD A STOCK TO THE STOCK FILE
2-CHANGE A LISTING ON THE STOCK FILE
3-CHANGE THE MARKET VALUES ON ALL THE STOCKS
4-PRINT OUT A LIST OF ALL STOCKS ON HAND
5-DELETE A STOCK
6-QUIT THE PROGRAM

CHOOSE";A
120 ONAGOTO130,290,300,340,440,460:GOTO100
130 GET1,LOF(1):QC=-1
140 QC=QC+1:IFQC=17THENFIELD1,255ASA1$:LSETA1$=STRING$(255,0):
    PUT1,LOF(1)+1:QC=0
150 GOSUB470:IFN1$<>STRING$(9,0)THEN140
160 N$="":M=-9:U=-9:K=-9:I=LOF(1)
170 IFN$<>""THENPRINTN$,
180 INPUT"NAME OF STOCK";N$:IFN$=""THEN180
190 IFM>=0THENPRINTM,
200 INPUT"NUMBER OF SHARES PURCHASED";M:IFM<0ORM>30000THEN200
210 IFU>=0THENPRINTUSING"###.##";U,
220 INPUT"UNIT COST OF STOCK";U:IFU<0ORU>300THEN220
230 IFK>=0THENPRINTUSING"###.##";K,
240 INPUT"CURRENT MARKET PRICE OF THE STOCK";K:IFK<0ORK>300
    THEN240
250 N$=LEFT$(N$,9):CLS:PRINT"STOCK NAME",N$:PRINTM;"SHARES
    OWNED":PRINTUSING"UNIT PRICE $$###.##";U:PRINTUSING"MARKET
     PRICE $$###.##";K
260 A$="":INPUT"DO YOU WANT TO MAKE ANY CORRECTIONS IN THE
     ABOVE";A$:A$=LEFT$(A$,1):IFA$="Y"THENPRINT"AS THE CURRENT
     VALUES ARE DISPLAYED, MAKE THE CORRECTION, IF YOU WANT TO
     KEEP THE VALUE, PRESS ENTER":GOTO170
270 IFA$<>"N"THEN260
280 LSETN1$=N$:LSETM1$=MKI$(M):LSETU1$=MKI$(U*100):
    LSETK1$=MKI$(K*100):PUT1,I:GOTO100
290 INPUT"WHICH STOCK DO YOU WANT TO CHANGE THE LISTING OF
     ##";J:I=INT((J-1)/17)+1:QC=J+16-I*17:GET1,I:GOSUB470:
    N$=N1$:M=CVI(M1$):U=CVI(U1$)/100:K=CVI(K1$)/100:GOTO250
300 CLS:PRINT"AS THE STOCKS ARE DISPLAYED, ENTER THE CURRENT
     MARKET PRICE":FORI=1TOLOF(1):GET1,I:FORJ=0TO16:QC=J:
    GOSUB470:IFN1$=STRING$(9,0)ORN1$=STRING$(9,32)THEN330
310 K=CVI(K1$)/100:PRINTN1$;" #";CVI(M1$);"UNIT$";CVI(U1$)/100;"
    OLD MARKET$";K;:INPUT"NEW MARKET";K
320 LSETK1$=MKI$(K*100)
330 NEXTJ:PUT1,I:NEXTI:GOTO100
340 LPRINT"STOCK VALUES AS OF ";LEFT$(TIME$,8):LPRINT" "
350 LPRINT"ST STOCK.... NO.OF UNIT..$ ..... UNIT..$
     TOTAL..... ....."
360 LPRINT"## .....NAME SHARES...COST TOTAL COST .MARKET ....
    .MARKET GAIN//LOSS":LPRINTSTRING$(68,45)
370 TL=0:TG=0:GL=0:TC=0:TM=0:FORI=1TOLOF(1):GET1,I:FORJ=0TO16:
```

```
    QC=J:GOSUB470:IFN1$=STRING$(9,0)ORN1$=STRING$(9,32)THEN410
380 M=CVI(M1$):U=CVI(U1$)/100:K=CVI(K1$)/100
390 LPRINTUSING"## %        % ##### $###.## $##,###.## $###.##
    $###,###.## $##,###.##";I*17+J-16,N1$,M,U,M*U,K,M*K,M*(K-U)
400 E$=STRING$(43,32):TC=TC+M*U:TM=TM+M*K:GL=GL+M*(K-U):
    IFK>UTHENTG=TG+M*(K-U)ELSETL=TL+M*(U-K)
410 NEXTJ,I:LPRINTSTRING$(68,45):LPRINTUSING"TOTAL FIGURES
            $$######,###.##     $$#######,###.##";TC,TM;:
    LPRINTUSING"$$###,###.##";GL:LPRINT" ":LPRINTUSINGE$+
    " TOTAL GAINS$$###,####.##";TG:LPRINTUSINGE$+"TOTAL
     LOSSES$$###,####.##";TL
420 FORI=1TO12:LPRINT" ":NEXT:GOTO100
430 END
440 INPUT"WHICH STOCK DO YOU WANT TO DELETE THE LISTING OF ##";
    J:I=INT((J-1)/17)+1:QC=J+16-I*17:GET1,I:GOSUB470:PRINT"DO
     YOU WANT TO DELETE ";N1$,:INPUTA$:A$=LEFT$(A$,1):IFA$="Y"
    THENLSETN1$=STRING$(9,32):PUT1,I:PRINT"STOCK DELETED":
    GOTO100
450 PRINT"STOCK NOT DELETED":GOTO100
460 CLOSE:PRINT"GOOD MORNING!":END
470 FIELD1,QC*15ASA1$,9ASN1$,2ASM1$,2ASU1$,2ASK1$:RETURN
```

NOTES

0=Zero and O=Oh
Do not use line feed (down arrow) in any lines except in line 110.

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10	149.00	nothing

SYSTEM/COMMAND

Phil Pilgrim

SOFTWARE LOWER CASE

SOFTWARE LOWER CASE (cake to be had and eaten too!)

Many TRS80 users have printers capable of printing lower case letters but, for one reason or other, have decided not to make the hardware lower case modification. This can make screen editing of printable text difficult when that text contains lower case letters, because all letters - upper and lower alike - are displayed as upper case. But it is possible, through software alone, to have (or at least simulate) lower case on the display, while printing full upper and lower case on the printer.

Let's assume that every letter we type on the keyboard without shifting be interpreted as "lower case". These letters are displayed as regular capital letters on the screen. Now, when we want "UPPER CASE", we hold down the shift key and type a letter. Such a letter should then be given a special designation on the screen. Here, we will precede it with a small graphics block, to show that it is "UPPER CASE". The printer routine, when called by LPRINT or LLIST then, will print regular (unshifted) letters as true lower case and shifted letters as upper case. This means, of course, that BASIC keywords will come out printed as if-then-else instead of IF-THEN-ELSE during a LLIST, but it won't affect the behavior of the program one bit.

The assembly listing shown in Figure 1 accomplishes these feats with three modules: 1) A start block (START) to link the other two modules into the display and line printer calling sequences, 2) A display driver (SDSPLY), which precedes every shifted letter on the screen by a graphic block and erases the block in the event of a backspace, and 3) A printer driver (SPRINT), which reverses the shift of all letters going to the printer.

To use this program, enter the source code shown into the editor/assembler, assemble it, and make a SYSTEM tape. Then initialize LEVEL II BASIC (ORG 7FABH assumes 16K) and set memory size to 32683. Load the SYSTEM tape, type the /ENTER to execute the start block, and BASIC will be ready with its new lower case personality - all without even having to plug in a soldering iron! ●

```
7FAB            00100           ORG     7FABH           ;MEM SZ = 32683
7FAB 2A1E40     00110 START     LD      HL,(401EH)      ;LINK IN SDSPLY
7FAE 22D57F     00120           LD      (LDSPLY+1),HL   ;     .
7FB1 21C67F     00130           LD      HL,SDSPLY       ;     .
7FB4 221E40     00140           LD      (401EH),HL      ;     .
7FB7 2A2640     00150           LD      HL,(4026H)      ;LINK IN SPRINT
7FBA 22F27F     00160           LD      (LPRINT+1),HL   ;     .
7FBD 21E97F     00170           LD      HL,SPRINT       ;     .
7FC0 222640     00180           LD      (4026H),HL      ;     .
7FC3 C3191A     00190           JP      1A19H           ;RETURN TO BASIC
7FC6 F5         00200 SDSPLY    PUSH    AF              ;MUST SAVE FLAGS
7FC7 79         00210           LD      A,C             ;GET CHAR IN A
7FC8 CDF47F     00220           CALL    SHIFT           ;A LOWER CASE LTR?
7FCB 3805       00230           JR      C,REGD          ; NO, REGULAR DISPLAY
7FCD 3E82       00240           LD      A,130           ;GET SHIFT GRAPHIC
7FCF CD3300     00250           CALL    0033H           ;DISPLAY IT
7FD2 F1         00260 REGD      POP     AF              ;RESTORE FLAGS
7FD3 C5         00270           PUSH    BC              ;SAVE CHAR
7FD4 CD0000     00280 LDSPLY    CALL    $-$             ;DISPLAY CHARACTER
7FD7 C1         00290           POP     BC              ;GET CHARACTER BACK
7FD8 4F         00300           LD      C,A             ;
7FD9 FE08       00310           CP      8               ;WAS IT BACKSPACE?
7FDB C0         00320           RET     NZ              ; NO, RETURN
7FDC 2A2040     00330           LD      HL,(4020H)      ;GET CURSOR POSITION
7FDF 2B         00340           DEFB    2BH             ;BACKSPACE
7FE0 7E         00350           LD      A,(HL)          ;PEEK AT PREV CHAR
7FE1 FE82       00360           CP      130             ;IS IT SHIFT GRAPHIC?
7FE3 C0         00370           RET     NZ              ; NO, RETURN
7FE4 3E08       00380           LD      A,8             ;MUST BACKSP AGAIN
7FE6 C33300     00390           JP      0033H           ;GO DO IT.
7FE9 F5         00400 SPRINT    PUSH    AF              ;MUST SAVE FLAGS
7FEA 79         00410           LD      A,C             ;GET CHAR IN A
7FEB F620       00420           OR      20H             ;MAKE LWR CASE IF LTR
7FED CDF47F     00430           CALL    SHIFT           ;SHIFT IF LETTER
7FF0 F1         00440           POP     AF              ;RESTORE FLAGS
7FF1 C30000     00450 LPRINT    JP      $-$             ;PRINT IT.
7FF4 FE7B       00460 SHIFT     CP      7BH             ;HIGHER THAN Z?
7FF6 3F         00470           CCF                     ;
7FF7 D8         00480           RET     C               ; YES, RETURN.
7FF8 FE61       00490           CP      61H             ;LOWER THAN A?
7FFA D8         00500           RET     C               ; YES, RETURN.
7FFB 79         00510           LD      A,C             ;GET ORIG CHARACTER
7FFC EE20       00520           XOR     20H             ;REVERSE ITS SHIFT.
7FFE 4F         00530           LD      C,A             ;AND PUT IT BACK.
7FFF C9         00540           RET                     ;ALL DONE.
7FAB            00550           END     START           ;AUTOSTARTS @ START.
00000 TOTAL ERRORS
```

Figure 1

(Continued from page 7)

A NOTE ON BASIC

Ever had trouble with loading a program but not find out about it until you were already using it. This can be frustrating, but it can be avoided very simply.

When a program goes bad on a load, you generally find only the end has had trouble loading. To check whether this has happened, we can simply put some statement at the end, that program control will be transferred to right at the beginning.

The best way to do this is to put your instructions for the program as a subroutine. You then call the subroutine from the first few statements. If it executes without error, chances are that the program is alright. If there is an error in the program, such as line number errors due to the read operation, then the program will not find the subroutine and an error message will be given directing the user to the line number and cause of the error.

Want to save both space the TIME in execution of your programs? Silly question, everyone does! But, it's a wonder that hardly anyone programing in BASIC uses integers, particularly for loop indices. An integer variable takes two bytes of storage space in memory compared to seven for a single precision variable (the default type for all BASIC variables). This savings in space also translates into a savings in speed in loops. Even more space can be saved by using a DEFINT to define the variables at the beginning of the program and save the space where the % sign would be to type individual variables as integers.

Since there is no standardization in BASIC for integer variables, it would be useful to introduce one. If we use the convention of FORTRAN, that all variables that begin with I,J,K,L,M, or N are integer variables unless specifically typed otherwise, then everyone would have an easier time making efficient use of printed programs.

AUTO-GRAPHICS

PHASE 80, P.O. Box 2177, Richardson, Tx. 75080 announces the availability of AUTO-GRAPHICS, A L1 4K utility program which takes the drudgery out of using complex graphic displays. It enables the user to quickly create complex graphic displays with simple interactive commands and instant visual feedback. Any or all of a display can be saved on cassette tape and later read in and displayed. It is available on cassette for $14.95 postpaid, with full instructions included.

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Business Computing | SYSTEM ANALYSIS

John Strader, CPA

My second article in this series will deal with the actual selection of accounting software. This article will give information which you should consider in selecting specific software systems or programs. It is designed so that a "yes" answer to any question would be good quality, although not necessarily in all situations. The following may be used as a place from which to start; it is not all inclusive and should be modified to suit your own situation or circumstance.

1. General hardware and software considerations. It is important to determine your needs before software and hardware selection begins. If you want standardized programs, realize that manual procedures may have to be changed to fit the computer program. In addition, your forms will probably need to be changed and your personnel will probably have to be retrained. The "plus" is that this type of software is generally less expensive.

If you want customized programs you can get the software to easily fit your operation and many of the forms you currently use may be incorporated. Customized programs will generally cost you more.

With both of the above it may be well to consider who will be doing the program maintenance.

The above, and those items which follow, should be kept in mind when writing up a request for proposal (RFP) to hardware and software vendors. Any RFP should be very specific and detailed.

2. Hardware requirements.
Things to consider here are the speed of the system, is there adequate disk and main memory space, and adequate printing speed? Is spooling (the ability to both enter and print data simultaneously through the use of system interrupts) supported? Will the hardware system and printer support word processing?

3. Software requirements.
What type of software and disk operating system will be used? Which computer language? Will the disk operating system support multiple terminals? What type of software development aids are available?

The software should be adequately documented, both the manuals and the code itself. Standard software should be easily modified and adapted to your system. Input routines should be designed to minimize input. It should automatically place the decimal points and provide sequence numbers where applicable.

For large data base programs the software should be able to recover vacant disk space. There should be an audit trail, and the software whould be able to cope with electrical power outages by using disk files with automatic periodic saving of array files to disk.

4. General Ledger.
Is it integrated with payroll, acccounts receivable, inventory, accounts payable and a cost system? It should print the following reports: general ledger accounts, trial balance, balance sheet, income statement, statement of retained earnings and a statement of changes in financial position. It should allow footnotes to statements, and should automatically prorate and post receiving entries such as depreciation, rent, insurance. It should post year-end entries, close files and consolidate G/L files.

5. Inventory System.
Points to consider here are: Is there an economic order quantity and reorder point in the system? Is there a model to determine the reorder point and economic order quantity? What model is used, and can it be changed or over-ridden manually? Can you review each item in the system and the amount on hand? Does it include price and can it figure gross cost for each item? Will it print out a purchase requisition or order, and can it be integrated into the general ledger?

6. Accounts Payable.
Accounts payable should have a check writing and purchase order entry routine. Is it integrated into inventory or general ledger? It should have search capability to automatically search files for payment dates and discounts. It should be capable of preparing a cash payments journal and/or a purchase journal.

7. Payroll
Will the payroll program print out quarterly reports and W-2's? It should figure withholding and FICA without entering data or rates for each employee. It should

print out a payroll journal as well as payroll slips. Is it integrated with standard cost or job cost systems and your general ledger? It should print out checks.

8. Accounts Receivable.
Some things to consider here are: Printing out a sales journal, cash receipts journal and is it integrated into the general ledger? Will it enable you to invoice and to prepare statements? Is there an aging report of open invoices and accounts? Will it print a customer list and mailing labels?

9. Cost accounting system.

What type of cost system: Standard cost, job cost or? Does the cost accounting system comply with IRS and cost accoounting's board regulations? Can you figure overhead by sales, hours, equipment use or other basis? Is it integrated with the general ledger to reduce data input? And, is there a good audit trail?

Next issue, we will look at some specific business programs. As we stated before, we will evaluate business software and documentation which is sent to us. Send your documentation or evaluation copy to the Journal, PO Box 7112, Tacoma, Washington 98407.

MAINTAINING EDITABLE LISTS

Richard L. Hackney
Western Kentucky U
Bowling Green, Ky.

```
1000 This "program" listing suggests how one may make use
1100 of the statement-managing and line-editing capability
1200 of LEVEL II Basic itself, without programing
1300 The trick is to treat the list as if it were a Basic
1400 program. The lines in the list should be numbered
1500 sequentially as in a Basic program, with generous
1600 space between line numbers to permit later insertion
1700 of new lines (items). Each line could contain up to
1800 255 characters, with a non-numerical character as the
1900 first character (other than spaces) following the line
2000 line number. For example:
2100 ----------------------------
2200    first item  description  quantity  etc
2300 second item  description  quantity etc
2400 ----------------------------
2500 The "program" is never to be run; rather it is simply
2600 a sequential file which can be saved, loaded, CSaved,
2700 CLoaded, Listed and LListed. Lines may be inserted or
2800 deleted on the basis of their statement numbers, and
2900 editing within a line is facilitated by the powerful
3000 edit commands of the Level II Basic
```

SOFTWARE REVIEW: STAR TREK FOR THE TRS80

Geo. Blank

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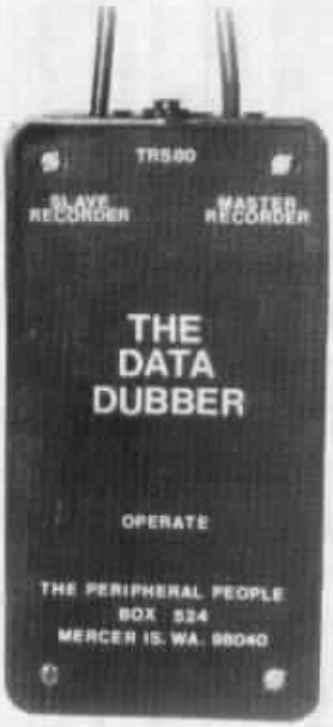
THE DATA DUBBER

PRODUCT REVIEW

M. Schmidt



The "Data Dubber" is a rather unique accessory for the TRS80 system. While the cassette data storage system is highly reliable, many high speed duplicated tapes (most commercial programs) are difficult to load. The Data Dubber was designed to minimize fiddling with the volume and missed loads. In addition, the Dubber can be connected between two recorders to make duplicates of any tape, including those in machine language.

The only external connections are two cords ending in plugs and a jack, all located at the upper end of the Data Dubber case. One cord, the "master" connects to the EAR connection of the tape recorder supplying the data. The cord from the TRS80 normally going to EAR is now plugged into the Dubber.

The Dubber is battery operated, but there is no switch to forget to turn on or off! It automatically will sense the presence of data and turn itself on and off! The battery is a standard 9 volts and lasts about three months with normal usage.

The circuit used is active, and consists basically of a threshold detector and two Schmitt triggers. It re-creates an almost perfect square pulse and provides a solid base line, free of hum. This makes the signal from the recorder going back to the TRS80 look exactly like the signals which originally came from the TRS80.

While the Data Dubber can be a godsend to the TRS80 owner, it cannot resurrect life. A program tape which has all the pulses recorded (even though they may be horribly distorted) is loadable with the Dubber. It cannot supply pulses from a "hole' or blank spot on tape.

We have been using a Dubber at 80-US for several weeks and have not yet found a tape which would not load, even though there were several which previously would not load under any conditions, and several others which loaded with much difficulty. Since there is no switch to worry about, it just sits there, behind the cassette recorder, and makes all tapes (so far) load on the first pass.

The Data Dubber comes in a very attractive case, is clearly labeled and the utmost in simplicity to use. It is available from the *Peripheral People*, Box 524, Mercer Island, Wa. 98040. The price is $39.95●

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RENEW THAT PROGRAM

(C) 1979 Bill Roberts

Bill Roberts
Virginia Beach, Va.

In Jan 79 we ran an article concerning the renewal of lost programs. Now, Mr. Roberts has come up with a clever way to do it with L2 16K or in DOS. This has a special appeal to those whose disk re-boots during execution.

This Renew program is generalized and will work on either the tape or disk version of Basic (with disk make sure you declare the same number of files). One small word of caution - after using the renew program don't attempt to RUN or UPDATE it! Not all the pointers are reset. So you need to first SAVE or CSAVE it out and load it back in, this action will automatically reset the necessary pointers for you.

This program takes advantage of the fact that location 40A4 always contains the address where the programs (L2 or DOS) start, regardless of the number of files. The Renew program goes to this location, gets the address of the forward line pointer (now Zero - the result of NEW). The program adds 4 to this start address to get past the line number and into the text. With the A, B, and C registers previously set it does a search for the end of the line (a 00 byte). When it finds the end, HL contains the address pointer to the next line number. This (HL) is what has to be in the locations cleared by the NEW/RESET. Once HL is stored in the address pointed to by 40A4 the commands LIST, SAVE, and CSAVE will work again.

The Basic program which follows POKES the Renew routine into memory. Though this routine can run anywhere in memory, it is set up for 16K at present, and will load starting at 32741 unless overridden. To locate this routine above 16K remember to use negative numbers.

After using this program to poke Renew into memory, create a SYSTEM tape (using TBUG) and a DOS command RENEW/CMD (using DUMP). This provides two ways of loading the object code without distrubing the Basic program in memory. The RENEW/CMD is stored with NO starting address so it doesn't really execute on DOS command. It is executed using SYSTEM command after Basic is reloaded.

```
10 REM            -- RENEW --
20 REM
30 REM    RESTORE PROGRAMS LOST BY "NEW" OR "RESET" (DOS)
40 REM    DON'T RUN OR UPDATE THE PROGRAM ONCE IT IS "RENEWED"
50 REM    "CSAVE" OR "SAVE" IT FIRST, THEN RELOAD TO UPDATE
60 REM
70 REM    COPYRIGHT 1979 BILL ROBERTS
80 REM
90 REM
100 INPUT "LOAD ADDRESS";A
110 IF A = 0 A = 32741:REM HI LOAD ADDRESS FOR 16K
120 FOR X = A TO A + 25
130 READ N
140 POKE X,N
150 NEXT X
160 END
170 DATA 042,164,064,062,000,071,079,035,035,035,035,237,177,
     221,042,164,064,221,117,000,221,116,001,195,112,000
180 REM
190 REM FOR THOSE INTERESTED, AN ASSEMBLY LISTING FOLLOWS
200 REM
210 REM 2A A4 40          :LD    HL,(40A4H)
220 REM 3E 00             :LD    A,0
230 REM 47                :LD    B,A
240 REM 4F                :LD    C,A
250 REM 23                :INC   HL
260 REM 23                :INC   HL
270 REM 23                :INC   HL
280 REM 23                :INC   HL
290 REM ED B1             :CPIR
300 REM DD 2A A4 40       :LD    IX,(40A4H)
310 REM DD 75 00          :LD    (IX+0),L
320 REM DD 74 01          :LD    (IX+1),H
330 REM C3 70 00          :JP    0070H
```

80-U.S. GOES TO THE FAIRE

The Fourth West Coast Computer Faire on intelligent machines for home, business and industry was held in San Francisco on May 11, 12 and 13, 1979. The Faire was more than fair, it was great. The first day of the Faire dawned bright and clear (as all good fairs should), and attendees poured through the doors and swarmed through the exhibits. This continued through 5 pm on the third day, after which the weary (but hopefully richer) exhibitors packed up their displays and headed for home.

There was no one "show stopper", rather there was a good range of interesting, amusing and somethimes exciting displays. It seemed like almost every third or fourth booth had a TRS-80, doing something. Some of them which caught our attention were:

MICRO COMPUTER DEVICES had an S-100 adapter connected to a TRS-80, and were producing glorius full color displays using a color TV.

HUH ELECTRONICS was showing off two versions of S-100 bus adaptors for the TRS-80.

Music was being created on TRS-80 by COMPU TALKER and others and J S Bach would have been proud.

Eight inch disk "Mega Box" was being displayed by MICROMATION and boasts up to 1 megabyte on line.

A "hard" disk for the TRS-80 was displayed by LOBO, and this one boasts of no less than 10 megabytes!

MALIBU DESIGN GROUP was showing off printers with very high resolution graphics - in a word, exquisite!

JADE occupied a commanding position in the main display hall. It must have taken a semi-truck to bring in their extensive display.

BYTE magazine was there, with copies of their new spin-off premiere issue of "Oncomputing".

MACROTRONICS displayed their M80 ham interface for the TRS-80. It is a complete morse code and RTTY system.

EXATRON CORP demonstrated the TRS-80 model of the Exatron stringy floppy, an innovative mass storage subsystem using a continuous-loop tape wafer which holds up to 40K bytes and loads about 4K in 6 seconds.

AUTOMATED SIMULATIONS, creators of "Starfleet Orion" have a new program, "Invasion Orion", which was shown.

We saw CP/M in operation on the TRS-80...FMG Corp. said PASCAL would be out later this summer...RACET COMPUTES showed off their GSF (Generalized Subroutine Facility) and DOSORT, a disk sort...The MAD HATTER was there with loads of software...there were at least two different lite pens being displayed... several data base management systems were on display... Allen Gelder showed his TBUG accessories, TLEGS and TSTEP... Howard Gosman of H&E COMPUTRONICS INC was there, as were Bill McLaughlin and Jeff Lasman of TRS-80 COMPUTING and Ed Thorn, of T-PAL. Manny Garcia and his associates were there from Chicago with all of their soft and hardware. Peter Jennings, SMALL SYSTEMS SOFTWARE, RECORTEC, INTERFACE AGE, KILOBAUD... the list goes on... were all there.

80-U.S. was there too, way back in the corner (which is what you get when you sign up late!), showing off a brand new Leo C program called "Bee Wary", due to be released in September. Judging from the crowd reaction, it will be as popular as Android Nim (we wondered what Leo would do for an encore).

It was tiring, hectic and fun. About the only thing we didn't see there was a computer controlled reverberating phrazmastic baffle plate! Will we be at the 5th Annual Faire???...You bet, and with bells on!

M. Schmidt

GIVE YOUR TRS-80 WHAT IT DESERVES

All tapes $10.00 each, on cassette.

A television station in Florida chose our Boilerplate program (catalog # CS-1) to use in a special news broadcast during the November 1978 statewide political elections. Many more users in mission-control-to-the-program-astronaut mode. And it loads and executes in less than 48!

One customer is using our Orbit programs (catalog # CS-2) to help him in the weather satellite work he does for the Air Force.

Recreation centers, schools, businesses, doctors, and housewives are using our Lend Out program. Lend Out (catalog # CS-7) keeps track of things loaned out to people. Its high utility, together with its many features and ease of use, have made it a best seller.

And speaking of best sellers:

Our Turkey Buzzard game (catalog # GT-4) has made an even bigger splash than we expected. It is a game that has everything: a detailed scenario, character animation, and a general arcade style. It's crowded full of dangers and comic pitfalls. No wonder there are those who say it may be the most successful work ever to combine a continually changing plot with all TRS-80 graphics capabilities. Already it is becoming a classic among classics.

All of the above programs will execute in less than 4K RAM! You don't get those programs from any other company. We invented them and only we own the rights to them. Sure you can buy one of those cheap "software library" deals, but most of the programs they feature can be found in books. Books you can check out from your public library for nothing.

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INTERFACING THE INTEGRAL DATA 125 PRINTER

Truman Krumholz
Springfield, Mo.

Truman tells about his effort to interface the Integral Data IP-125 printer to the TRS80 with a minimum of fuss. The manuscript he submitted was printed on the IP-125, using the TEXT80 text editor described in our Jan-Feb 79 issue. The IP-125 is available from several sources (check our advertisers!) for about $800.00.

I am using an Integral Data IP-125 printer with my TRS80. Mine has one option, the printer control, which costs an additional $39.00. I would strongly recommend this option for use with the TRS80, since it includes an automatic line feed which is lacking on the TRS80. Also, with this option there are four different print densities (under software control) and the ability to enhance characters. It also includes the ability to select and deselect the printer (also under software control).

The IP-125 requires a four microsecond or wider strobe pulse. The TRS80 parallel printer port provides a 1.6 microsecond strobe pulse. The IP-125 acknowledge signal is low when busy whereas the TRS80 busy terminal must be high when busy. These two signals are not compatible. Also, some way must be found to achieve proper timing of the acknowledge signal from the printer.

The way I did this, was to generate a sort of artificial busy signal after each character is sent to the printer. If this is not done the printer omits characters and finally hangs up. This method slows down the transfer of data, making the timing much less critical. The transfer rate is still faster than a 2400 baud interface.

One half of a 74LS123 one shot is used to make the strobe pulse for the printer (see Fig. 1). The TRS80 strobe pulse is fed to the one shot and the output pulse, now five microseconds wide, is used for the printer strobe pulse. This strobe pulse is also fed to the other half of the 74LS123. This one shot is triggered by the trailing edge of the strobe pulse. The timing of this one shot generates an output pulse approximately three milliseconds wide. This is the artificial "busy" signal. It is low when busy and high when not busy. The printer acknowledge signal has the same polarity. These two signals are fed to a two input nand gate (74LS00). Both signals must be high (not busy), for the output of the gate to be low. This low is the "not busy" signal for the TRS80.

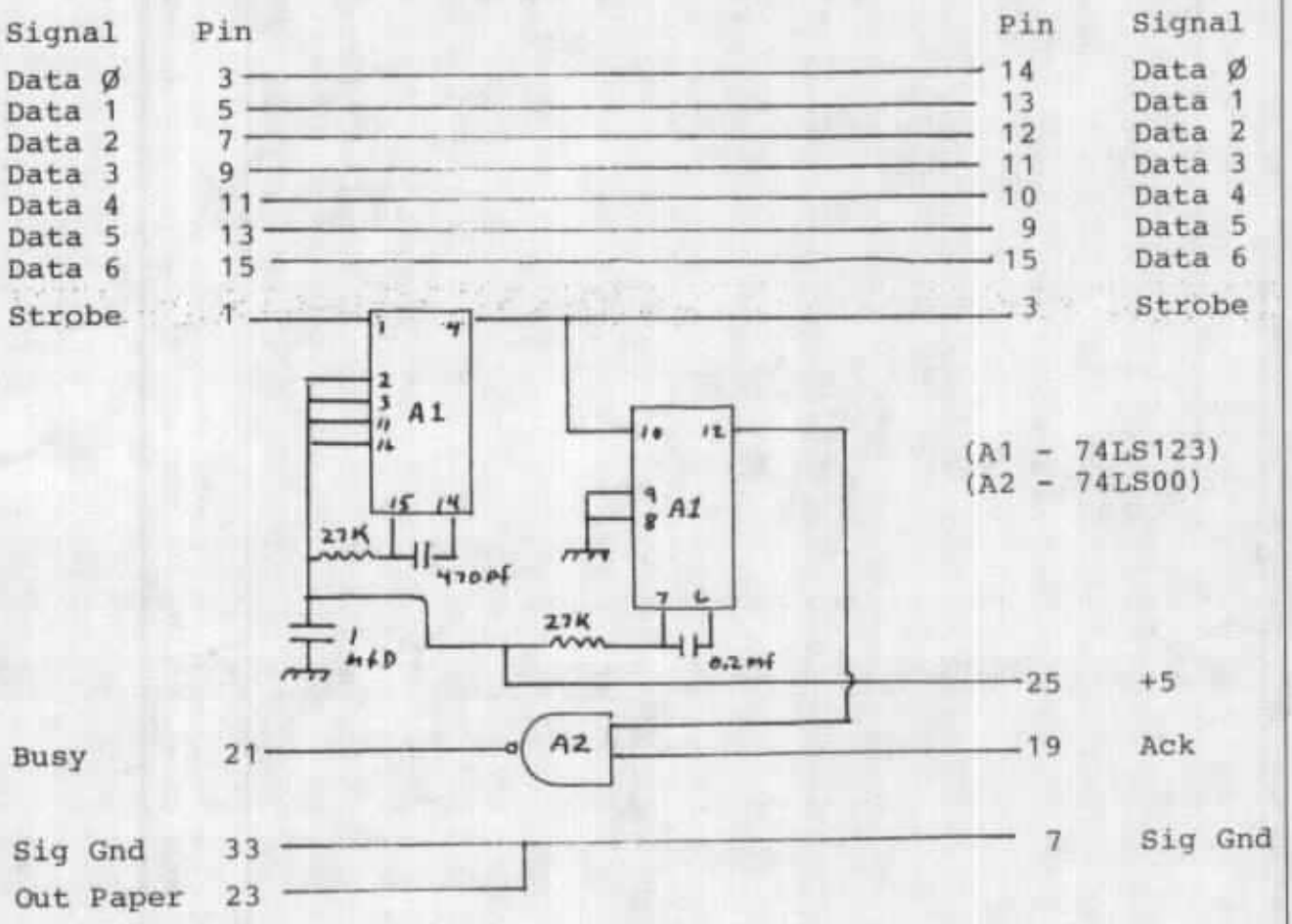
All data lines are fed directly. The five volts for the interface is obtained from the printer (Pin 25). A piece of perf board one and one-half inches square provides space for the interface. It is located at the printer end of a five foot cable.

There are a few things to remember for anyone using the interface described here. There are no "OUT PAPER" or "FAULT" signals provided by the printer. OUT PAPER on the TRS80 is pulled low by this interface. FAULT is made high by the TRS80. I did not provide a "printer on" signal to the TRS80; it thinks the printer is turned on, even when it isn't. This could easily be changed by using the printer five volts as control. I chose not to do this. If you POKE the printer driver address into the display driver as described in 80—US No 2. then you should use the printer's smallest print. The reason for this is that control code 31 is the printer code for the smallest character (16.5 CPI). If you are using larger characters, a CLS in the program will change the print to the smallest size. Any programs written for a printer will function normally.

I am very happy with the IP-125. I particularly like the auto line feed, the software controlled character style and although I don't have the lower case modification for the display, the IP-125 will print lower case.

TRS-80
Expansion Interface
Line Printer Port

IP-125



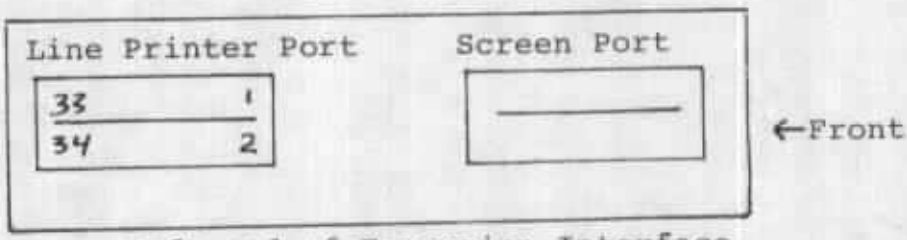


Figure 1

AUTOK · QEDIT

AUTOK and **QEDIT** make BASIC programming a breeze. **AUTOK** gives your keyboard auto-repeat: just hold any key down, and after a short delay the character repeats about eight times per second. **QEDIT** lets you edit any one line BASIC statement on the screen, in place and in full view. It's much faster and easier to use than BASIC's EDIT; plus it even allows you to change line numbers. Included are a SYSTEM cassette for Level II, an instruction card, and special instructions for dumping the program to a DOS command file. **$15.**

The new SK version of **AUTOK/QEDIT** does all the above, plus it gives you single-keystroke entry of 25 common BASIC keywords. Just hold down the shift key, hit a letter key, and an entire word (FOR, NEXT, CHR$(, etc.) appears at once. The result? Greatly accelerated program entry. Version SK includes the Level II SYSTEM cassette, instruction card, DOS instructions, and a special keyboard layout card showing the command locations. **$19.**

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FOR THE LITTLE NYBBLERS

L.B. Christopherson

Peter Piper picked two hundred pickled peppers.
Two hundred pickled peppers Peter Piper picked.
When Peter Piper ate one eighth of the peppers he picked,
On how many pickled peppers did Peter Piper get sick?

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